

# **Attachment 207**

### **EXPERT REPORT OF MARSHINI CHETTY, Ph.D.**

I am an Associate Professor at the University of Chicago's Department of Computer Science, with a Ph.D. in computer science. I have twenty years' experience in human-computer interaction ("HCI") and my research and peer-reviewed publications address, among other things, the usability of web interfaces and the presence of manipulative designs (sometimes known as "dark patterns") on websites.

The Federal Trade Commission ("FTC") asked me to render an expert opinion on:

- (1) whether the design of how Amazon enrolls consumers in Prime during online checkout confuses consumers;
- (2) whether the design of how Amazon enrolls consumers in Prime during online checkout conveys information on Prime's material terms (cost, end of free trial period, and renewal terms) that consumers can comprehend; and
- (3) whether the design of the Prime Iliad and Iliad 2.0 cancellation processes confuses consumers.

To provide an opinion, I performed two evaluations that are widely accepted and used in the HCI field. First, I conducted a cognitive walkthrough (which is an inspection method) to evaluate the design of the enrollment points within the checkout process and cancellation interfaces from the viewpoint of a consumer by studying the design of each interface using foundational principles of good design in HCI. These principles include ensuring that (1) consumers can discover and know all of their options to select the option that best meets their goal, (2) consumers know what the consequences of their actions on an interface are, (3) consumers have a sense of control when using the interface and can undo actions with ease, and (4) the design of each interface is consistent so consumers can easily navigate them. For my cognitive walkthrough, I also applied Colin M. Gray's Dark Pattern Ontology, which contains the most comprehensive, frequently used, and recent taxonomies of dark patterns. Second, I conducted a think-aloud study, which is an empirical, qualitative user study, to understand consumers' experience navigating Prime enrollment within the checkout process and Prime cancellation.

Based on my cognitive walkthrough of the design of the Prime enrollment points ("Prime detours") in the online checkout process and of the Iliad and Iliad 2.0 cancellation processes; the user study I conducted to test these designs; and my personal experience as a HCI researcher and professor, the designs of Prime enrollment within the checkout process are confusing to some consumers, who, as a result of dark patterns, unintentionally select an option to enroll in Prime when purchasing a product online. Similarly, the designs of Prime cancellation are confusing to some consumers, who do not successfully cancel online as a result of dark patterns.

## Table of Contents

I. Credentials and Qualifications.....	4
a) Research.....	4
b) Publications.....	6
c) Awards and Honors.....	8
II. Required Statements and Disclosures .....	8
III. Scope and Summary of the Opinion and Materials Considered .....	9
IV. Human Computer Interaction and Dark Patterns.....	11
a) Human Computer Interaction (“HCI”) .....	11
b) Foundational Principles of Good Design in HCI.....	12
c) Dark Patterns.....	14
d) The Manipulative Effects of Dark Patterns.....	15
e) Gray’s Dark Pattern Ontology .....	17
V. Methodologies Used .....	23
a) Types of User Studies In HCI.....	23
b) Reviewing Data Collected via User Studies in HCI .....	24
i. Inspection Method: Cognitive Walkthrough .....	25
ii. Empirical User Study Method: Think Aloud Study .....	26
c) Interpreting Qualitative Study Results.....	27
d) Selection of Methods for User Studies in this Report.....	28
VI. My Cognitive Walkthrough of the Online Checkout Process Shows that the Design of the Prime Detours Can Confuse Consumers into Unintentionally Enrolling in Prime and Does Not Convey Prime’s Material Terms Well. ....	29
a) Overview and Cognitive Walkthrough of the SOSP on Desktop and Mobile Devices .....	33
b) Overview and Cognitive Walkthrough of the UPDP on Desktop and Mobile Devices .....	36
c) Overview and Cognitive Walkthrough of the Ship Option Select Page Prime Decision Page (SOSP PDP).....	43
d) Overview and Cognitive Walkthrough of the Single Page Checkout (SPC).....	44
e) Overview and Cognitive Walkthrough of the True Single Page Checkout (TSPC).....	50
f) The Prime Enrollment Detours in the Online Checkout Process on Desktop and Mobile Devices Confuse Consumers and Do Not Clearly Convey Prime’s Material Terms. ....	55
VII. The Cognitive Walkthrough of the Iliad and Iliad 2.0 Shows that the Online Cancellation Process Is Difficult to Find, Has Too Many Steps, and Uses Manipulative Designs to Prevent Consumers from Cancelling Prime.....	60
a) Overview and Cognitive Walkthrough of the Iliad Cancellation.....	60
i. Finding Iliad .....	62
ii. Iliad’s Marketing Page.....	64
iii. Iliad’s Offers Page.....	68

iv.	Iliad’s Cancellation Page.....	71
b)	Overview and Cognitive Walkthrough of the Iliad 2.0 Cancellation.....	74
i.	Finding Iliad 2.0 .....	75
ii.	Iliad 2.0’s Marketing Page.....	75
iii.	Iliad 2.0’s Cancellation Page.....	78
VIII.	Think Aloud User Study Of Amazon Prime Enrollment and Cancellation Screens.....	81
a)	Methods for the Think Aloud Study .....	82
b)	“CandyForever” Website Design and Implementation.....	82
c)	Considerations to Achieve Study Realism and Mitigate Limitations .....	84
d)	Study Protocol.....	86
e)	Study Recruiting .....	90
f)	Participant Demographics.....	91
g)	Pilot Study.....	92
h)	Data Analysis.....	93
i)	Pilot Study Results.....	95
j)	User Study Results.....	95
k)	Notes On Interpreting Study Findings .....	103
IX.	Conclusion .....	104

## I. Credentials and Qualifications

1. I am an Associate Professor at the University of Chicago's Department of Computer Science, where I have served on the faculty since 2019. I am an expert in human-computer interaction (also known as "HCI"), usable privacy and security, and ubiquitous computing. I am the director of the Amyoli Internet Research Laboratory (known as the "AIR Lab"), which is part of the Department of Computer Science.
2. Prior to my employment at the University of Chicago, I was a Research Scholar at Princeton University's Department of Computer Science, where I served on the faculty from 2016 to 2019 and founded and directed the Princeton Human Computer Interaction Laboratory.
3. I was also an Assistant Professor at the University of Maryland, College Park, where I served on the faculty of the College of Information Studies from 2013 to 2016. During my time at the University of Maryland, I directed the NetCHI HCI research laboratory.
4. I received my Ph.D. in Human-Centered Computing from Georgia Institute of Technology in 2011. I also received my Master's of Science degree in Computer Science, awarded with distinction, from the University of Cape Town in South Africa in 2005. I received a Bachelor's of Science (Honors) in Computer Science, awarded first class honors, in 2002 and a Bachelor's of Science in Computer Science with distinction—as well as subject distinctions in my two majors, Computer Science and Psychology—in 2001 from the University of Cape Town in South Africa.

### a) Research

5. I am a leading expert in the area of dark patterns and have conducted significant research in this field. As explained below in Sections IV(c)-(d), dark patterns are misleading user interfaces designed to steer users to make a decision misaligned with their intention and that they may not have made if they had the information they needed to make that decision [8,29,50–52].
6. I have dedicated my career to studying how people have used the Internet over time, from when people first had just one or two computers connected together and to the Internet to the present day. Among other things, I have studied misleading interfaces in contexts such as online shopping, streaming services (like Netflix) and social media.
7. Specifically, I conduct studies of the ways people use different kinds of technologies (such as apps, websites, devices, etc.) and the problems or challenges they face online. After identifying problematic interfaces in these technologies—such as those with dark patterns—I create and test new interfaces or systems to provide solutions. Often the studies I conduct result

in publicly available datasets for other researchers [51,53,73]. I use these studies to inform and test the design of both proof-of-concept prototypes and fully functional systems. The goal is to make research contributions regarding how to improve people's Internet use, and particularly to ensure they can use the Internet in a way that meets their expectations and which preserves privacy and security [14,89].

8. I have conducted many research studies on dark patterns. I have studied disguised advertisements on social media platforms, when influencers (*i.e.*, those who have the power to affect the purchasing decisions of others through social media) do not tell users that they are being paid to sell products online, creating a tool to detect and flag these disguised advertisements on YouTube [53,89]. I have also studied dark patterns when people are trying to delete their social media accounts [74] and in streaming video platforms such as Netflix [76]. I have also done a study on how websites comply with California Consumer Privacy Act (CCPA) regulations for privacy and their use of dark patterns [91].
9. I conducted one of the first large scale studies to measure how common dark patterns are in 11,000 of the most popular shopping websites globally [51]. Regulators have cited this study to refine their consumer protection regulations regarding manipulative and deceptive interface designs that hamper consumers' decision-making processes and providing informed consent [8,31].
10. As the director of AIR Lab, I supervise, mentor, and fund PhD, master's, and undergraduate students to conduct research on a variety of projects using different techniques. AIR Lab projects have included studies on content moderation on social media, dark patterns on shopping websites, and the use of voice-assistant based wellness interventions for marginalized older adults. I have advised approximately ninety-five Ph.D., master's, and undergraduate students at the University of Chicago and other institutions, including the University of Maryland, College Park, Georgia Institute of Technology, and Princeton University. AIR Lab students have gone on to undergraduate and graduate studies at top institutions in computer science, such as the University of Washington, Princeton University, and Columbia University. Many now work at top technology companies, such as Uber, Microsoft, and Meta, and in government positions such as positions with the Competitions and Markets Authority in the United Kingdom (an entity which strengthens business competition and prevents anti-competitive practices).
11. My research has helped advance our understanding about the way people think about how the Internet works which is helpful for creating systems that people can use effectively. These contributions include providing insights into conceptual models of the Internet; in other words, my research enables me to explain how people think the Internet works [45]. My work has also

documented how people use the Internet in their day-to-day lives from which I developed new ideas for designing technologies and user interfaces on the Internet. For instance, I conducted empirical studies demonstrating people often do not realize that influencers on social media may be paid to include links to websites for the products on their social media feeds in a process called affiliate marketing [53]. I then created and evaluated a publicly available tool for Internet browsers (Chrome and Firefox) called AdIntuition that shows users when YouTubers have affiliate links in their YouTube video descriptions so that they know when they are watching product endorsements [89]. Finally, my work has real world impacts on global companies, the research community, Internet policy, and public awareness. For example, I have discussed my research results directly with organizations including Tor [98] in the past and worked with Tor to change the wording and text in their materials to help people better understand how to use Tor's browser. (Tor is a browser that helps users circumvent censorship and be anonymous online). In the research community, my work spurred the creation of an annual interdisciplinary symposium to discuss privacy and security issues with researchers from many fields (e.g., computer science, policy, and information studies) around the world. This symposium, called the Applications of Contextual Integrity, is now in its seventh year.

12. In my research, I use established qualitative methods generally accepted in my field such as interviews, surveys, or lab-based experiments to understand how people think; their "mental models" of privacy, security, content on the Internet; and Internet costs. In my research, I also utilize quantitative methods such as network measurements or web scraping to gather empirical evidence about how people use the Internet [11,16,32,44,66–68,70]. I work with everyday people to test my prototypes to ensure that the interventions I design work in the real world. In many cases, this means I partner with outside entities for my research projects, including elementary schools, medical clinics, national laboratories, and private companies to gain deeper insights into user needs and broaden the impact and reach of the research I conduct [94].

#### **b) Publications**

13. I have authored and co-authored at least 51 publications in peer-reviewed publications in computer science in HCI and usable privacy and security at the highest ranked publication venues in these areas. I regularly publish in top-tier Association for Computing Machinery (ACM) sponsored HCI and usable security conferences and journals including the conference on Human Factors in Computing (CHI), Computer Supported Collaborative Work (CSCW), Transactions on Human Computer Interaction (TOCHI), the Symposium on Usable Privacy and Security (SOUPS) and top tier security conferences including USENIX Security and IEEE Security and Privacy.

14. Researchers and regulators in the United States and Europe frequently cite the taxonomy<sup>1</sup> I advanced in my paper, “Dark Patterns at Scale, findings from a Crawl of 11K Shopping Websites,” and it is one of the 10 most frequently cited taxonomies on dark patterns [8]. Harry Brignull—the UX researcher who coined the term “dark pattern”—recognized the taxonomy I created as one of the most significant dark pattern taxonomies in his seminal book on dark patterns, *Deceptive Patterns: Exposing the Tricks Tech Companies Use to Control You* [8]. My paper also won the Annual Privacy Papers for Policymakers award. Additionally, I co-authored an article “Dark Patterns, Past, Present, and Future,” outlining the history of dark patterns [56].
15. I currently serve as the Papers Co-Chair for the Conference on Human Factors In Computing Systems (or CHI for short), which is the top conference in the field of human-computer interaction. In this role, I am responsible for overseeing the review process for approximately 5,000 research papers and coordinating hundreds of expert reviewers to peer review and select the most rigorously conducted and executed papers to appear in the conference program for the 2025 event.
16. My Ph.D. dissertation is: “Making Infrastructure Visible: A Case Study of Home Networking.” My research focused on helping Internet users understand how to better manage their Internet speeds, privacy, and security [15]. As part of the work, I conducted interviews with Internet users who were the first to have multiple computers connected to the Internet in their homes. I then designed, implemented, and tested a system to monitor and control home Internet speeds from a centralized display system on a home router [13]. My research focused on how this system helped people see who was using the most data in their homes and why their Internet speeds may be slow—for example, if there is a heavy Internet user in the home or unauthorized use—to help better manage Internet speeds and costs.
17. My master’s dissertation is: “Developing Locally Relevant Applications For Rural South Africa.” I worked with a rural clinic and hospital to develop a telemedicine system for communication between the two sites, using a participatory action research design approach over the course of two years [17]. I designed a simple user interface with a technology called Voice over the Internet Protocol, which was not widely in use in the country at the time, to create the system which was an early version of an messaging app similar to Skype, WhatsApp, and Facebook Messenger [12]. When we tested the system with nurses at the rural clinic to see if they could better communicate with the single doctor at the rural hospital nearby about patients, it was found to be helpful for treating patients at the clinic instead of referring everyone to the hospital which was a considerable distance away and hard to get to over

---

<sup>1</sup> A taxonomy is a system used to classify and organize concepts.



poorly maintained dirt roads, particularly for someone who was not well. This project evolved over time and is still in existence today in another rural village in the country.

**c) Awards and Honors**

18. Over the years, my work has also been recognized with best paper awards at conferences, including the 2023 conference on Human Factors in Computing (CHI), the Computer Supported Collaborative Work conference (CSCW), the Symposium on Usable Privacy and Security (SOUPS).
19. Regulators also recognized my work, as I was recognized with a Privacy Papers For Policy Makers award as noted in my curriculum vitae.
20. My work has been partially funded through three Google Faculty research awards, a Facebook “Securing the Internet” grant, multiple National Science Foundation (NSF) awards including the NSF CAREER award, the National Security Agency (NSA), the National Institute of Health (NIH), and several University of Chicago seed grants.

**II. Required Statements and Disclosures**

21. This report constitutes the complete statement of all of the opinions I intend to express at this time, along with the bases and reasons for them. However, I reserve the right to supplement these opinions as necessary if I receive new information; am asked to supplement this Report; or am asked to rebut or otherwise respond to other reports, testimony, or information.
22. The opinions set forth herein are based on my professional expertise, as well as the facts identified in Attachments B-V. At this time, I have not prepared any exhibits to summarize or support my opinions, but I reserve the right to do so if I receive new information; am asked to supplement this Report; or am asked to rebut or otherwise respond to other reports, testimony, or information.
23. My qualifications are stated in Section I of this Report. A list of publications that I have authored, including all publications I have authored within the last ten years, are included in my curriculum vitae, which is included as Attachment A to this Report.
24. I have not previously consulted with the FTC. I have not testified as an expert at trial or deposition in the last four years. For my work in this matter, including any testimony, I am compensated by the FTC at a rate of \$300 per hour for my work in this matter. My compensation is not dependent on the outcome of this matter.

### III. Scope and Summary of the Opinion and Materials Considered

25. The FTC engaged me in the matter of *Federal Trade Commission v. Amazon.com, Inc. et al.* The matter concerns the enrollment and cancellation processes for Amazon's Prime subscription program. The FTC asked me to evaluate: (1) whether the design of how Amazon enrolls consumers in Prime during online checkout is likely to confuse consumers, (2) whether the design of how Amazon enrolls consumers in Prime during online checkout conveys information on Prime's material terms (cost, end of the free trial period, and renewal terms) that consumers can comprehend, and (3) whether the design of the Prime Iliad and Iliad 2.0 cancellation processes likely confuses consumers.
26. To answer the FTC's questions, I studied the Prime enrollment and cancellation processes that the FTC provided me. As I explain further below, the FTC provided me with information about the Prime enrollment and cancellation processes at issue, including, among other things, a series of static screenshots from Amazon's online product checkout process on desktop and mobile interfaces, as Prime enrollment processes, labelled "Prime detours" in this report, are located within product checkout, and for the cancellation process on desktop and mobile devices.
27. In forming the opinions expressed in this report, I evaluated the processes' usability and identified features that render the information in the enrollment processes unclear or confusing, or that prevent consumers from comprehending the information presented to them about a Prime subscription, or that complicate the cancellation process, including dark patterns. I explain my methodology in Section V.
28. I also conducted a user study to confirm how people interact with the Prime enrollment processes during online checkout and the Prime cancellation processes. To do so, together with a small team, I built an experimental website modeled as closely as possible to the Prime enrollment process during product checkout and the Prime cancellation process on a desktop device and conducted a user study. The results of the user study allowed me to determine what, if any, aspects of the interfaces pose challenges for obtaining consumers' consent to enroll in Prime, consumers' understanding of Prime's cost and renewal terms, and enabling consumers to cancel Prime.
29. Below is a list of the materials considered:
  - (i) All materials supporting the user study referenced in Section VIII of this report;
  - (ii) All attachments to the Sealed Amended Complaint (Dkt. #69);
  - (iii) Screen captures of undercover Prime enrollment and cancellation

produced by the FTC to Amazon; and

(iv) Documents produced to the FTC by Amazon, including<sup>22</sup>:

1. AMZN\_00003615;
2. AMZN\_00003614;
3. AMZN\_00047290;
4. AMZN\_00047293;
5. AMZN\_00046782;
6. AMZN\_00046832;
7. AMZN\_00046056;
8. AMZN\_00148393;
9. AMZN\_00046411;
10. AMZN\_00003615;
11. AMZN\_00037197;
12. AMZN\_00045964;
13. AMZN\_000148392;
14. AMZN\_000148393;
15. AMZN-PRM-FTC-000345889;
16. AMZN-PRM-FTC-00034;
17. AMZN\_0004;
18. AMZN\_00047191;
19. AMZN\_00046063;
20. AMZN\_00037187;
21. AMZN\_00045964;
22. AMZN\_00148392;
23. AMZN\_000148395;

---

<sup>22</sup> Some of these Bates numbers represent the first page of a document, in which case the whole document is included.

- 24. AMZN-PRM-FTC-000345892 - AMZN-PRM-FTC-000345893;
- 25. AMZN\_00046108;
- 26. AMZN\_00046374;
- 27. AMZN\_00046683;
- 28. AMZN\_00037202;
- 29. AMZN-PRM-FTC-00034;
- 30. AMZN\_00046276;
- 31. AMZN\_00003614;
- 32. AMZN\_00046351;
- 33. AMZN\_00046640;
- 34. AMZN-PRM-FTC-000345897 - AMZN-PRM-FTC-00034;
- 35. AMZN\_00046881;
- 36. AMZN\_00037188;
- 37. AMZN-PRM-FTC-000345894 - AMZN-PRM-FTC-00034;
- 38. AMZN\_00000001;
- 39. AMZN\_00040704;
- 40. AMZN\_00156681;
- 41. AMZN\_00080154; and
- 42. Amazon's Supplemental Responses and Objections, pages 1 through 30.

#### **IV. Human Computer Interaction and Dark Patterns**

##### **a) Human Computer Interaction ("HCI")**

- 30. Human-computer interaction is a well-established multidisciplinary field spanning computer science, psychology, sociology, and design that focuses on the interaction between people and computer technologies[23,27,46,78,81]. The purpose of HCI is, in part, to determine whether the design of a computing technology, such as a website or a smartphone app, allows people to achieve their goals on that interface [78].
- 31. In the HCI field, the people using a computing technology are known as

“users.” [10,23,78]. A central concern of HCI is to design computing technologies (for example, smart watches, computers, e-readers, cellphones, and sensors) that are, in fact, usable. [10,23,78] To design usable computing technologies, designers must understand who the users are—in other words, who are the people who will use the system?— as well as where, when, and how users will interact with the system. [10,23,78] Designers therefore must understand the context in which users will be using the system. For instance, knowing whether users will be engaging in other activities while using the system is important. Designers also typically study what feelings users feel when using a system, such as pleasure, satisfaction, frustration, or confusion. [10,23,78] Equipped with all of this information, designers can create a system with an enhanced user experience.

32. User experience design (“UX design”) is a term that originated after HCI was developed as a field. [27]. It focuses specifically on making a user's experience with a product easy and intuitive [42,61]. Rather than focusing solely on the interaction between a human and a technology, user experience is about understanding and designing the entire experience a user has with a system, from how it integrates into their lives to how to design the system's interface. The term was first popularized in the early nineties and has been used in industry to refer to designers and researchers focused on product design [42,61]. This could entail usability goals, such as making a system easy to learn; easy to remember how to use and; effective, efficient, and safe to use. It could also entail ensuring that the system has good utility and user experience goals, such as eliciting a range of desired feelings and emotions (i.e., being satisfying, enjoyable, helpful) and limiting undesired feelings (i.e., being frustrating, annoying, or unpleasant.) [78]

#### **b) Foundational Principles of Good Design in HCI**

33. Experts in the field of HCI recognize foundational good design principles from a user's perspective. These principles are taught in computer science classes and are detailed in textbooks on the subject such as the widely used Sharp et al.'s *Interaction Design: Beyond Human-Computer Interaction* and Dix et al.'s *Human Computer Interaction* textbooks and HCI introductory classes at Georgia Tech, Stanford, Carnegie Mellon University, and the University of Washington [23,78]. Examples include Don Norman's principles of good design and Jakob Nielsen's ten usability heuristics for user interface design [57,60,80,81,101]. These foundational principles include the following four elements:

- (i) The interface design needs to make it possible for users to discover and know all of their options so they can select the one that meets their goals [57,60,80,81,101]. Interfaces should not contain irrelevant information so as to not diminish the visibility of relevant information [57,60,80,81,101].

- (ii) The interface design needs to provide feedback to the user by clearly communicating the consequence(s) of the action(s) they took on an interface [57,60,80,81,101].
  - (iii) The interface design needs to provide the user with a sense of control over their actions on the interface [57,60,80,81,101], including allowing a user to undo an action or back out of a process without going through another extended process [57,60,80,81,101].
  - (iv) The design of interfaces that are part of the same system should be consistent with each other, i.e., positioning, colors, icons, etc., so the user can easily navigate the interfaces and does not need to process large amounts of new information [57,60,80,81,101].
34. Manipulative design choices often violate foundational HCI principles of good user experience and interface design [22,38,55,70, 81] because they can interfere with a user's understanding of the interface and the full universe of their options, their knowledge of the consequences of their actions on the interface, and their sense of control of the interface [57,60,80,81,101].
35. In *The Design of Everyday Things*, Don Norman—an established leader in HCI who coined the term “user experience”—developed principles of good design based on the “human action cycle,” which is a psychological model describing the steps that people take when interacting with computer systems [60]. Specifically, the human action cycle describes “stages of action” in the process during which users form goals when interacting with computer systems, develop a series of actions to achieve that goal on the system, and then execute those actions [60]. Understanding the human action cycle is key for interface designers [60]. Norman further breaks down the “stages of action” into questions researchers should ask from the perspective of a user, such as “what do I want to accomplish?”, “what are the alternative action sequences?”, “what action can I do now?”, “how do I do it?”, “what happened?”, “what does it mean?”, and “have I accomplished my goal?”. These questions are based on good design principles, such as making it easy for a user to determine what actions are possible in a system. When there is misalignment between a user's mental model, their goals, and the system design, a user can do something they did not intend to or misunderstand how to use a system [60].

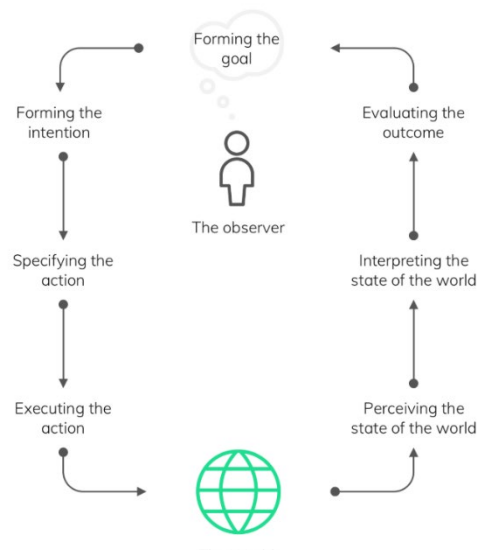


Figure 1: Norman's Seven Stages of Action

### c) Dark Patterns

36. First coined in 2010, the term “dark patterns” describes tricks used in web-based apps, websites, and social media to make users do something they did not intend to do, such as purchasing a product or service, allowing access to their private data, signing up for a subscription, or keeping an online account open [7]. Specifically, “dark patterns” describe a set of interface choices and designs that affect a user’s decisions through the design of the “choice architecture” (i.e. how and what choices and information is presented to a user) on a service provider (i.e., an app, website, or social media site) at a particular point in time [7,29,49, 51, 52]. In other words, dark patterns are user interface design choices that coerce, deceive, or manipulate users into making a decision that, if fully informed or otherwise capable of selecting an alternative, they would not have made. In fact, “dark patterns” are commonly referred to as “deceptive patterns,” “deceptive designs,” or “manipulative designs.” [7,29,50-52]. “Dark pattern” design choices often violate the very basic HCI principles of good user experience and interface design [23, 46, 60, 78, 81].

37. Typically, the decisions that users select as a result of dark patterns’ presence benefit the service provider operating the app, website, or social media site [29,31,49,51,52]. For instance, a user may select an option to allow the collection of their user data or enroll in a subscription program even though they would not have done so had they been fully informed of the consequences of their action [29,31,49,51,52].

38. User studies of people’s reactions to dark patterns show that dark patterns

steer users into making decisions that are inconsistent with their intentions [21,49]. Dark patterns are so pervasive that, according to some research, they even manipulate users who are *aware* of the dark patterns [5]. Those users who are tricked by dark patterns despite being aware of them also suffer the negative effects of the dark patterns, as they are also prone to unintentionally selecting options that cause them to spend money, give up their online privacy, start a subscription, or keep an account open [5,31]. A study I helped conduct also shows that even when a user has an explicit goal to protect their privacy, dark patterns can still be effective at getting them to choose less privacy-preserving choices when signing up for a video-streaming service [43].

#### d) The Manipulative Effects of Dark Patterns

39. This section discusses the ways in which dark patterns—including the ones I reference in Section IV(e)—impact a consumer’s ability to make an informed decision in an online interaction that is aligned with their intention.
40. Dark patterns are effective at manipulating users because they affect how users act on information they see on interfaces. Generally, people have two ways to process information they receive, known as “System 1” and “System 2” thinking [102].
41. System 1 thinking is a mode of cognitive processing that is quick, automatic, and instinctive, requiring little to no effort [39,92,95]. System 1 thinking is not under voluntary, deliberative control, as the body knows what to do [39,92,95]. Examples of System 1 thinking are riding a bicycle, absentmindedly reading text on a billboard or computer screen, tying shoelaces, and dodging a tennis ball.
42. System 2 thinking is a mode of cognitive processing that is deliberative, conscious, and requires mental attention [39,92,95]. A person’s sense of agency, choice, and concentration’s affect their System 2 thinking [39]. Examples of System 2 thinking are deciding what to eat for lunch, deciding on a bike ride path, calculating a tip, and writing an email.
43. People generally use cognitive shortcuts when they engage in System 1 thinking, as it enables them to get through everyday activities without having to sit and concentrate on every single task set before them [39,92,95]. Dark patterns work well in user interfaces because users are often less engaged in deliberative, effortful mental processing every time they navigate from a screen to the next [95]. I describe below some of the cognitive shortcuts that underpin the dark patterns I noted and cause users to miss important information and make unintended choices.
44. Dark patterns leverage cognitive and behavioral biases to limit users’ autonomy and impact their ability to decide what option to select. Each dark



pattern impacts the choices and information presented to users and adds a layer of difficulty to their ability to decide what to do [39,40,90]. Users typically rely on cognitive and behavioral shortcuts (System 1 thinking) as opposed to engaging in rational decisional making (System 2 thinking, in their online Interactions [95]. As explained above, these cognitive shortcuts help users process information.

45. Dark patterns modify the choice architecture available to users in two ways. They either modify the decision space that users see (so, for example, users do not see all the information relevant to their decision-making), or they manipulate the information flow presented to users (so, for example, users are pushed to select one option over others.) [52].

46. Multiple large- and small-scale user studies show that dark patterns effectively manipulate users to select choices that benefit the service provider. [28,34,43,49,62,84].

(i) In particular, a seminal user study in 2021 asked a census-weighted sample<sup>3</sup> of 1,962 users to opt into a negative option plan<sup>4</sup> for free data monitoring and credit protection while exposing them to 1) no dark patterns (the control group), 2) mild dark patterns, and 3) aggressive, compounded dark patterns. The dark patterns included confirmshaming (*see infra*, ¶ 55), adding text such as “Recommended” to options presented to users to create a false hierarchy of information, and setting the default to the opt-in option [50]. The rates of acceptance of the protection plan in the control group were very low (~11%). However, the acceptance rates of the plan doubled in the mild dark patterns group and increased to 41.9% in the aggressive dark patterns group. This study also provided evidence that marking “Accept” as the default option for users or indicating that it would be more difficult to decline a plan than to accept it led to higher opt-in rates.

(ii) Another user study on cookie consent notices<sup>5</sup> in 2019 also shows the extent to which dark patterns manipulate users [93]. This study, conducted in the European Union with nearly 82,000 users of a German e-commerce website, showed that the position of the cookie consent notice on the screen influenced whether users clicked on it. For example, cookie consent notices that appeared as bars at the top of the screen had the lowest interaction rates. Additionally, users were more

<sup>3</sup> Census weighting is a process that adjusts sample data to make it more representative of the entire population.

<sup>4</sup> A negative option plan is a contract where a consumer’s silence or inaction can be interpreted as accepting an offer.

<sup>5</sup> A cookie consent notice is a notification that informs visitors of a website about the types of cookies that the website uses, how the website may collect and use personal data, and who has access to this data.

likely to interact with cookie consent notices when there were only two options (accept and decline), as opposed to more than two options that were more granular. Users were also more likely to click “Accept” even if there were only two options of “Accept” and “Decline” given if the Accept button was highlighted but the Decline button was not (50.8 % mobile, 26.9 % desktop) than when both were presented as equal options (39.2 % mobile, 21.1 % desktop) [93]. This study also showed that nudging visitors to accept privacy-invasive defaults (where users have to specifically opt out) were more likely to make consumers consent to accept cookies than opt in notices (where users have to specifically opt in.) [93]

(iii) Furthermore, another user study had 2,252 participants in the United Kingdom go through an online interaction on a fictitious online trading platform to buy a financial product [100]. The results showed that the use of dark patterns—specifically Visual Interference, False Hierarchy, and Confirmshaming, *see infra*, Section IV(e)—increased the rate at which users unintentionally bought the product. [100]. Moreover, the accumulation of dark patterns in a single screen and in subsequent screens were more effective at getting the users to buy the product, when compared to the control group who was not exposed to dark patterns. [100]. These findings suggest that dark patterns working in concert with each other or over the course of several screens in an interaction hamper the obtention of consumer consent. [100].

(iv) Several more recent studies have also been undertaken on whether dark patterns affect the decision to purchase a good or obtain a service or what choices to make when signing up for a streaming service [43].

47. These studies, and others, demonstrate that interface decisions like placement of information and number of choices on a screen as well as whether certain choices are highlighted or selected by default, i.e., dark patterns are manipulative and can steer users into making choices that they may not have otherwise made if fully informed and capable of selecting alternatives [83].

48. **Dark patterns** are more prevalent and insidious on mobile platforms in apps and on mobile browsers than on desktops [21,33,74]. For instance, a study of 240 of the most popular Android apps found that users cannot easily spot dark patterns on a mobile device and that some users, such as children, are particularly vulnerable to these kinds of dark patterns. [22].

#### e) Gray’s Dark Pattern Ontology<sup>6</sup>

49. Researchers have created ontologies and taxonomies of dark patterns to label

<sup>6</sup> An ontology is similar to a taxonomy. The difference is where a taxonomy is used to classify and organize, an ontology is used to model and reason.

and classify manipulative designs in the interfaces of websites, apps, social media, voice user interfaces and other platforms to help identify common tactics that service providers use to manipulate users. [7,8,29,31,49, 51,52] Ontologies and taxonomies for dark patterns allow researchers to utilize a shared language to identify and discuss these dark patterns, organize them into categories, and discuss the harms resulting from each category of dark patterns. [29,31].

50. The ontology laid out by Colin M. Gray (the “Gray Dark Pattern Ontology”) consolidates the ten most frequently cited taxonomies that regulators and academics have created—including my own work—into a canonical organization of dark patterns [31]. I used the Gray Dark Pattern Ontology in this report because it is the most comprehensive, frequently used, and recent taxonomy of dark patterns.
51. The Gray Dark Pattern Ontology organized dark patterns in three levels: high-level, meso-level, and low-level. [31]. Table 1 below reflects the dark pattern categories and levels as laid out In Gray's taxonomy. [31].

**Table 1: Relevant Dark Patterns in the Gray Dark Pattern Ontology**

<b>High-Level Dark Pattern</b>	<b>Meso-Level Dark Pattern</b>	<b>Low-Level Dark Pattern</b>
Forced Action	Nagging	
	Forced Continuity	
Interface Interference	Manipulating Choice Architecture	False Hierarchy, Visual Prominence
	Bad Defaults	
	Emotional or Sensory Manipulation	Positive or Negative Framing
	Choice Overload	
	Hidden Information	
Obstruction	Roach Motel	
	Creating Barriers	
	Adding Steps	

Sneaking	Bait and Switch	
	Hiding Information	Sneak Into Basket, Hidden Costs
Social Engineering	Personalization	Confirmshaming

52. High-level patterns consist of the most abstract elements of an interface that are manipulative, coercive, or deceptive and limit a person's ability to take an action that is consistent with their intention. [31] These high-level patterns are context-agnostic, which means they are described generally without being tied to a specific context or domain. [31] High-level patterns describe *strategies* of manipulative, coercive, or deceptive elements. [31] Sneaking, Obstruction, Interface Interference, Forced Action, and Social Engineering are examples of high-level patterns. [31]; *see supra*, Table 1.

53. Meso-level patterns, which connect high- and low-level patterns, describe the approach of a dark pattern that limits, impairs, or undermines a user's ability to make an informed decision and take an action that reflects their decision. [31]. These meso-level patterns are either context-agnostic or specific to the context of use or application type (such as shopping). [31]; *see supra*, Table 1. Meso-level patterns describe a dark pattern's *angle of attack*.

54. Low-level patterns identify problematic designs in a specific context that summarize the ways in which visuals or temporal elements on the Interface limit or undermine users' autonomy and decision making. [31]; *see supra*, Table 1. Low-level patterns describe the *means of execution* of a dark pattern.

55. Below, I identify and explain the main high-, meso-, and low-level categories of dark patterns that I observed in both (a) Prime enrollment detours from the checkout process and (b) cancellation processes that the FTC provided me. [31].

(i) **Forced Action** (high-level) is a strategy that requires the user to perform an extra action to complete a process or access (or continue to access) certain functions on the system they are using [31, 29]. For instance, a service provider that requires a user to sign up for an account on a website to view the website's content is using a Forced Action dark pattern. [31].

a. **Nagging** (meso-level) focuses on resource depletion. [29]. Nagging in the dark pattern contexts reflects the literal meaning of the word: a service provider employs Nagging when it repeatedly interrupts the user with a request to take an action—even when the user has already rejected that request. [31]

Nagging typically occurs to users who are in the midst of completing a primary task. [31]. For example, Nagging occurs when a service provider that sells products on its website interrupts a user going through the purchasing process by repeatedly presenting the user with an unrelated task, such as enrolling in a subscription. Nagging depletes the user's time and attention over time and makes them more likely to relent and take an action that does not reflect their intention, such as enrolling in a subscription, so they can quickly resume their primary activity, such as completing their online purchase. [31].

- b. ***Forced Continuity*** (meso-level) subverts the user's expectation that a subscription they began will not auto-renew or continue and instead makes it difficult for the user to end the subscription or to become aware that the subscription is still active. [31]
- c. Both Nagging and Forced Continuity have been shown to influence user's decisions in signing up for a website service [49] and have also been found in numerous domains including account deletion interfaces and social media more generally [55,75]

(ii) **Interface Interference** (high-level) is a strategy that where a service manipulates the user interface to make information that is most beneficial to the service provider more visible or accessible to users over other information [29,31].

- a. ***Hidden Information*** (meso-level) hides information that is important for a user to make a decision. [31]. For instance, a service provider is using the Hidden Information dark pattern when it hides the cost of a subscription when presenting a user with a subscription offer. [31].
- b. ***Bad Defaults*** (meso-level) preselects an option for the user. Preselecting the most expensive plan option is a common example of a Bad Default dark pattern. [31].
- c. ***Manipulating the Choice Architecture*** (meso-level) describes where a service provider makes it harder for a user to decline an action rather than to accept it. This dark pattern occurs where, for instance, a service provider makes it harder to decline enrolling in a subscription than to agree to the enrollment. [31].
  - ***False Hierarchy*** (low-level) gives one or more options more visual prominence over others, particularly when all options should be given the same consideration. [31]. Users may, as a result, make a selection based on

incomplete information. [31]. For example, making the “enroll” button brighter and more visually attractive and graying out the “decline” button to make it less noticeable on a website that offers a subscription is an instance of False Hierarchy.

- **Visual Prominence** (low-level) makes a distracting element more prominent than the element relevant to the user’s goal to make the user forget about their original goal. [31].

d. **Emotional or Sensory Manipulation** (meso-level) uses specific wording to play on a user’s emotions. [31]. A service provider uses Emotional Manipulation by using words to make a user feel a sense of loss when the user attempts to cancel a service. [31].

e. **Choice Overload** (meso-level) confuses a user by overwhelming them with too many options, causing the user to select an option that is not aligned with the user’s intentions. [31].

(iii) **Obstruction** (high-level) occurs when a service provider includes unnecessary steps within a process to stop users from taking certain actions or to make it harder than necessary for them to do so. [7,29]. Obstruction patterns include making a service Hard to Cancel. [51]. Obstruction is often found in interfaces where a user is trying to unsubscribe or delete an account. [75,79].

a. **Roach Motel** (meso-level) creates a situation that is more difficult for a user to get out of than it was for the user to get into. For instance, the Roach Motel dark pattern exists when a user signs up for a service and finds it more difficult to cancel the service. [31].

b. **Creating Barriers** (meso-level) describes a situation where a service provider intentionally creates barriers to cancelling a paid subscription by burying options, adding confusion to the process, or limiting access. [31].

c. **Adding Steps** (meso-level) creates additional points of unnecessary but required user interaction to complete a task. [31].

(iv) **Sneaking** (high-level) hides, disguises, or delays giving the user information that is relevant to their decision-making. Sneaking is a tactic that is commonly used to get users in the shopping domain to purchase items or subscriptions. [51].

a. **Hiding Information** (meso-level) subverts the user's expectation that they will see all relevant information they need to make an informed decision to the user and instead hides or delays the disclosure of information. For example, where a service provider hides language that indicates a user will be enrolling in a subscription, such as a subscription's price and recurring nature. In using this tactic, service providers often focus the user's attention on something that is being given for free so the user could subscribe without realizing it. [51]. A user in this context may not understand that the free trial will auto-renew and that they will be charged periodically once their trial period ends, until they cancel the subscription [7].

- **Hidden Costs** (low-level) hides costs a user may have to pay in a conspicuous manner or only showing them after the user has paid. [31].

- **Sneak into Basket** (low-level) adds items to a user's cart without explicitly disclosing them to the user. [31].

b. **Bait and Switch** (meso-level) subverts a user's expectation that their selection will result in their desired outcome and, instead, leads them to an unexpected, undesired outcome. [31].

(v) **Social Engineering** (high-level) presents options or information to a user such that the user is more likely to take specific action based on their individual or social cognitive biases based on their quick thinking, or System 1, skills. [31,102]. Social engineering dark patterns often play on a person's desire to be socially acceptable or follow social norms.

a. **Personalization** (meso-level) subverts a user's expectation that the information will be presented to all users in a similar way and, instead, uses "personal data to shape elements of the user experience that manipulate the user's goals while hiding other alternatives."

- **Confirmshaming** (low-level) shapes "accept" and "decline" options through emotional language or imagery to shame or guilt the user into selecting. [31]. Researchers have found confirmshaming in many different domains such as shopping websites, consent notices, social media, and account deletion interfaces. [30,51,62,75,84].

## V. Methodologies Used

### a) Types of User Studies In HCI

56. It is typical in HCI to conduct user studies of interfaces to identify usability problems with systems and the user experience of using a system, e.g., whether it is pleasing to use. [23,27,46,78]. This type of user study, known as an “evaluation,” focuses on studying users’ interaction with a system through a variety of methods to determine whether the system is effective. [23,27,46,78]. User studies for evaluation can identify usability and conceptual problems with a system design which can be rectified or improved upon.
57. Methods include, but are not limited to, observing users’ interaction and asking them questions in interviews, conducting surveys, running an experiment and logging users’ actions. [23,27,46,78]. For instance, researchers looking to evaluate an online shopping site might create a study where they first ask users how they engage in online shopping and then watch them use an online shopping system before questioning them about it. [23,27,46,78]
58. There are two types of user studies for evaluation in HCI: (1) inspection methods and (2) empirical user studies in controlled or natural settings. [78].

(i) Inspection methods are user studies where an HCI expert identifies usability issues based on their knowledge of usability, what they believe the user's behavior would be, the contexts of the system's use, and the kinds of actions they know a user might take (the user in this case being the end user of the system). [57-59, 101]. While going through interfaces, the researcher uses established guidelines depending on what the researcher is studying. For example, a researcher studying the design of an interface from the perspective of a user will refer to the foundational principles of good design in HCI (*see supra*, Section IV(b)), and the Gray Dark Patterns Ontology (*see supra*, Section IV(e)) to identify any issues with the interface. HCI experts use inspection methods because they can evaluate how well the system performs for various user tasks almost as well as an end-user of the system would. [23,27,46,78]. The researcher analyzes the interface by asking what problems and points of confusion a user may have when using an interface and what aspects of the designs do not follow best practices and principles of good interface design. [23,27,46,78]. Cognitive walkthroughs are one of the most frequently used inspection study methods. [78]. Inspection methods are useful even when a researcher does not have access to a fully functional working version of a system and can be used with screenshots or videos of the system. HCI experts routinely use these techniques in their research to identify dark patterns [21,52,55]. Additionally, it is common to analyze screenshots for the



presence of dark patterns [51,74].

(ii) Empirical user studies involves watching users in a real-world setting or controlled setting interact with a system and collecting data on how well the Interface allows users to achieve their goal(s). [23,27,46,78].

a. When conducting an empirical user study, HCI researchers typically collect data in various formats, such as recording what people are saying and doing, asking them to complete surveys or collecting their demographic information, and writing notes on what the researchers observe [46].

b. These studies sometimes involve capturing screenshots of a system's interaction flows to see how users interact with the system and to identify strengths and weaknesses in the system design from the perspective of the user.

c. The data indicates whether users understand how to use the system, what misconceptions they may have, and what aspects of the system helps (or fails to help) users achieve their goals. [23,27,46,78]. These studies can take place with a real-world deployment of a system or with an approximation of a system, such as a prototype. [23,27,46,78].

d. To analyze the recorded data, HCI researchers use quantitative or qualitative data analysis, or sometimes both, depending on the dataset. Qualitative user studies are a particularly useful tool to gather in-depth feedback on how users view and use a system and to identify any problems with a user interface. [23,27,46,78]; *see infra*, Section V(c). For interview data and screenshots, qualitative data analysis is more appropriate and can be conducted using a rigorous process such as thematic analysis. [19,72].

59. Evaluation user studies uncover users' mental model of the system, which is to say a representation of how they believe the system works and what is happening in the system that will allow them to achieve their goals.

#### **b) Reviewing Data Collected via User Studies in HCI**

60. In a thematic analysis, researchers first review the collected data to construct a set of "codes" or labels for phenomena of interest such as "points of confusion". After a research team discusses the code book or set of labels and agrees that it is complete, the team then apply these labels to the data set. In qualitative data analysis, a data set can be analyzed in this manner by one or more researchers. Typically, having at least two researchers coding or labelling the data is more time efficient and for some data sets, measures of how much agreement in labeling between coders can be calculated. When the

data is coded for input to a thematic analysis, this measure of inter-coder reliability is not necessary, and agreement can be reached through regular team discussions and meetings during the coding process. [54]. Team members usually code a subset of the data first to ensure they are in agreement before splitting the coding process into primary and secondary coding responsibilities.

61. Once the data is coded whereby each piece of data is coded primarily by one research team member (primary coder) and then coded again by a second team member (the second coder), the research team then discusses what the most important themes are in the data set. The research team then examines the codes of most interest and creates a summary of the most important themes emerging in each code. The thematic summaries are then used to report on the major themes emerging from the data set as a whole.
62. During the qualitative data process, existing frameworks such as the Gray Dark Patterns Ontology can be used to code the data. A qualitative data analysis process can also support the analysis of the results of expert review or inspection processes such as cognitive walkthroughs or heuristic evaluation.

**i. Inspection Method: Cognitive Walkthrough**

63. Cognitive walkthroughs using established heuristics are a common inspection method in HCI. [46,57,59,78]. A cognitive walkthrough is an inspection method that is usually used to evaluate how easy (or not) it is for a user to use a system by simulating a user's problem solving process at each point in a set of interaction flows with the system [48,65,85,96]. Specifically, cognitive walkthroughs can indicate how easy it is for a user to learn how to use a system, and it can also uncover general usability issues. [48,65,85,96]
64. To conduct a cognitive walkthrough of an interface, the researcher needs to know 1) who the users are, 2) what sample tasks the user would complete while using the interface, 3) what actions a user needs to take to complete the tasks, and 4) the description or implementation of the interface in some form. [48,65,85,96].
65. The expert should determine, in particular, whether the user will 1) achieve the right effect aligned with their intention on the interface, 2) notice that a correct action to take is available in the interface, 3) know that that correct action is associated with the effect they are trying to achieve, and 4) make progress towards solving their overall task (for instance, buying a product on an online checkout flow) [78].
66. During the walkthrough, the expert can note what they think users need to know to complete the task, design issues, and what needs to happen for a user to complete a task successfully. If the design is appropriate, the cognitive

walkthrough will reveal that a user using the interface will know which option to select on the interface to accomplish their goal and will know that they successfully accomplished their goal, or are headed towards it, through feedback—one of the principles of good design (*see supra*, Section IV(b)). The results of a cognitive walkthrough therefore reveal what problems, if any, exist in the design of an interface where a user is not able to accomplish their goal, or does not know what they accomplished on the interface.

67. An expert can conduct a cognitive walkthrough with screenshots of an interface or videos of the system in lieu of the online working system itself without the need to find actual users of the system to observe what they do at each point in the system. [48,65,85,96]. Many studies of dark patterns have used cognitive walkthroughs to identify dark patterns in an interface such as in social media. [21,38,55].

68. Additionally, a researcher conducting a cognitive walkthrough typically uses established heuristics, which are set of best practices in interface design to identify potential problems users may have with a system. Heuristics are essentially criteria that focus on the aesthetics and the functionality of an interface [57–59]. By using heuristics for good design, a researcher does not have to rely on what they think is good or bad design to evaluate a system, but rather on established rules and guidelines for design. Heuristics include principles such as making designs consistent, using terms users can easily understand, and minimizing cognitive efforts for users during use of the system. Other heuristics include whether the system makes it clear what the status of the system is, how easily the system prevents errors, making the system flexible and easy to use as discussed in Nielsen’s 10 Usability Heuristics for User Interface [101].

## ii. Empirical User Study Method: Think Aloud Study

69. A think aloud study is a type of user study or a form of observation where a researcher asks a user to talk through what they are doing with a system as the researcher observes. [47]. HCI researchers use think aloud studies to understand how users are thinking about and understanding a system. [1,2,24,48].

70. By asking users to think aloud and verbalize their thought processes as they navigate a website or interface, a researcher can map out their cognitive processes, such as how they are engaging in decision-making and what factors on the interface are affecting their choices and their understanding of the system at any given point in time. Researchers can therefore pinpoint problems with a system based on data from think aloud studies, specifically on what problems user participants describe. Think aloud studies reveal problems as and when participants go through an interface, rather than relying on them to remember issues that they had in retrospect. Researchers are able to ask follow up questions, too.

71. The sample size for a think aloud study can be small to pinpoint issues. [1,2,24,48]. Think aloud studies can be conducted with screenshots or mock-ups in lieu of a working system for valid results. [1,2,24,48].
72. Participants in the think-aloud studies should represent the target users likely to use a system [1,2,24,48] and the instructions for the think-aloud study can be simple, such as “Tell me what you are thinking as you work and if you find something confusing” and so on. Researchers must make it clear to participants that they are unable to help with tasks and that they are not evaluating how well the participants are doing but rather the system itself. Researchers in think-aloud studies can provide minimal nudges to remind participants to verbalize their thoughts such as “What are you thinking?” or “Why did you do that?” The researcher can give assistance only if it appears the participant would otherwise quit the task altogether.
73. Think-aloud studies can be video-recorded so that the researchers can capture what is occurring on a screen and audio-record what a participant is saying for analysis. Analysis requires a systematic study of all the notes, recordings, and comments participants made to identify problems, points of confusion, and issues that need to be addressed in the system. Results are reported in specific terms to highlight what needs to be improved in a system. [1,2,24,48].
74. Think-aloud studies have been used in HCI since the technique was first introduced and are still in extensive use today, as evidenced by recent papers in the field. [25,36,71,86,99].

### c) Interpreting Qualitative Study Results

75. Qualitative studies, including cognitive walkthroughs and think aloud studies, are generally not meant to generate large quantitative effects or significant statistical measures because they are typically conducted on smaller sample sizes. [19,46,72,78]. Rather, they are meant to produce in-depth insights and anecdotes of users’ lived experiences to identify interface strengths and weaknesses. This does not mean that the number of participants who exhibit a particular phenomenon in a user study cannot be reported; it only means that these numbers are only meant to provide a sense of the prevalence of certain themes in the data, as opposed to statistically significant evidence.
76. Qualitative studies are highly regarded in HCI for this purpose and are used extensively to test the usability of interfaces and understand users’ cognitive processes and mental models—for example, how users are thinking about the system in their heads and how that affects their use of the system.
77. The advantages of the methods I used to evaluate the materials the FTC provided are that they are simple, provide useful insights, and can be used to

determine how a system is used. [23]. Potential disadvantages of these techniques, particularly for observations such as think-aloud studies, are that users can change their behavior because they are being observed. However, adhering to the research guidelines for think-aloud studies minimizes these disadvantages. Asking participants to walk through their task again after they think-aloud can also generate additional data that users can explain and interpret after they complete the test. [23].

**d) Selection of Methods for User Studies in this Report**

78. The FTC has asked me to review the online checkout flow and cancellation processes (the interfaces at issue) in this report, it provided me and to opine on them. I opted to use an inspection method and an empirical study method applying rigorous systematic procedures that are widely accepted in the HCI field. [23,27,46,78,81]. In this report, I used standardized techniques that are best suited for each type of analysis. By using standardized methods and techniques and formal analysis process, I ensured that my opinions have been formulated in the most rigorous manner possible.

79. First, I began my review with an inspection method technique which is a well-established practice to uncover usability issues in online flows [58]. Researchers, including myself, use established and accepted principles of design to assess the usability of an online interface. [1,2,24,48]. To conduct an inspection of a flow, researchers need only documentation of the system that is being examined, such as screenshots and other documentation of the flow. [1,2,24,48]. A single researcher can perform a heuristic evaluation or a cognitive walkthrough but may not uncover all the problems in an interface. [57,59,78,96].

80. To analyze whether the Amazon processes that the FTC provided me allowed consumers to make selections on the interface that reflect their intention, I used an inspection method known as a cognitive walkthrough using established heuristics in a systematic manner. I also used the Gray Dark Pattern Ontology, for reasons I have explained in Section IV(e).

81. Second, I conducted a user study using a replica of the Amazon enrollment pathways in the product checkout process and the cancellation processes for two primary reasons. First, conducting a user study ensured that my inspection of the processes uncovered a complete list of usability issues, as I identified additional issues I observed in study participants' real-time interactions with the interfaces at issue. [23,27,46,60,78]. Second, the user study allowed me to verify that the issues I identified in my expert inspection actually affected real-world users in the ways I expected. [57,59,78,103–105].

82. To render my opinion as laid out in this report, I used two inspection or expert review techniques called cognitive walkthrough and heuristic

evaluation.

83. For my cognitive walkthrough, I used a combination of well-established heuristics described above: the principles of good design, the 8 golden rules, and the Gray Dark Pattern Ontology. I applied these three sets of heuristics to evaluate each screen. It is well-established that a single expert evaluator cannot uncover all problems with an interface using a heuristic evaluation [58,59,78]. As such, my evaluation may not reveal *all* dark patterns present in the Amazon flows but rather most of them [78].
84. For the empirical user study, I used a think-aloud protocol to understand what users were thinking and their decision-making process while using the system. The think aloud protocol is useful when running a user study. For this user study, I developed an interactive website that mimicked the Amazon Prime website as closely as possible under the guise of a candy store. This user study provided insights into real-world issues that users may have with Amazon as they are navigating the site. Although I did not study mobile versions of the Amazon enrollment and cancellation processes in the user study, the issues identified are likely to be more pronounced on a mobile device where there is more of need for scrolling, where users may be multi-tasking, and the screen real estate is smaller. *See supra*, Sections VI (enrollment) and VII (cancellation).

## **VI. My Cognitive Walkthrough of the Online Checkout Process Shows that the Design of the Prime Detours Can Confuse Consumers into Unintentionally Enrolling in Prime and Does Not Convey Prime's Material Terms Well.**

85. In this section, I discuss how consumers enroll in Prime while going through the online checkout on Amazon, based on information the FTC provided me. I then explain the big picture design issues in these processes that I found during my cognitive walkthrough before providing an in-depth analysis of each page's design.
86. To evaluate the design of the Prime detours in the online checkout process on desktop and mobile devices, I performed a cognitive walkthrough using the foundational HCI design principles and the Gray Dark Pattern Ontology I described in Section V.
87. The information contained in this section regarding how the online checkout process works was provided to me by the FTC. I also generally confirmed that information by reviewing videos of the Prime product checkout and static images that I understand to have been produced by the Amazon or captured by the FTC from the Amazon website.
88. After a consumer adds an item to their cart on Amazon and proceeds to purchase the item, they go through the online checkout process. During this

process, Amazon steers consumers towards Prime detour points multiple times, where they may mistakenly enroll in Prime.

89. The FTC asked me to assume that there are two types of online checkout processes on desktop devices: (1) the Multi-Page Pipeline (“MPP”) and (2) the True Single Page Checkout (“TrueSPC”). The FTC asked me to assume that the MPP is the only online product checkout process on mobile devices and that the TrueSPC replaced the MPP on desktop devices.
90. The FTC asked me to assume that the below flowchart reflects the MPP and TrueSPC processes, and the differences between them.

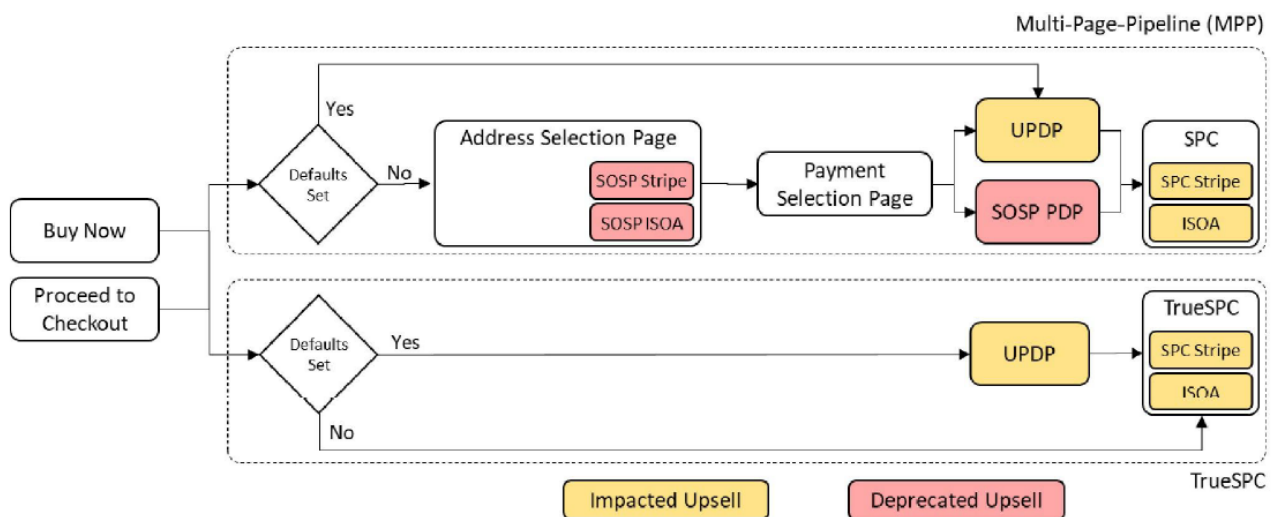


Figure 2: A flowchart of the MPP and TrueSPC

### **Multi-Page Pipeline**

91. The FTC asked me to assume that a consumer purchasing a product on Amazon through the MPP checkout on a desktop device can, on the “Product Detail Page,” add the product to their cart and start checking out by selecting the “Buy Now” or “Add to Cart” and (for consumers who clicked “Add to Cart”) the “Proceed to Checkout” yellow (or orange) buttons. Consumers without a saved address or payment method then see a “Ship Option Selection Page” (SOSP), where they can select their shipping option for their item, then a Payment Selection Page, where they select their payment method. They are then directed to the SOSP Prime Decision Page (SOSP PDP) or Universal Prime Decision Page (UPDP). Consumers with saved billing and shipping information skip the SOSP and Payment Selection Page and are immediately directed to the UPDP. The Single Page Checkout Page (SPC) is the final page in the MPP process, where consumers can place their final order.



92. The FTC asked me to assume that the flowchart below illustrates the MPP on a desktop device. I also confirmed this through reviewing videos of the product checkout provided by the FTC.

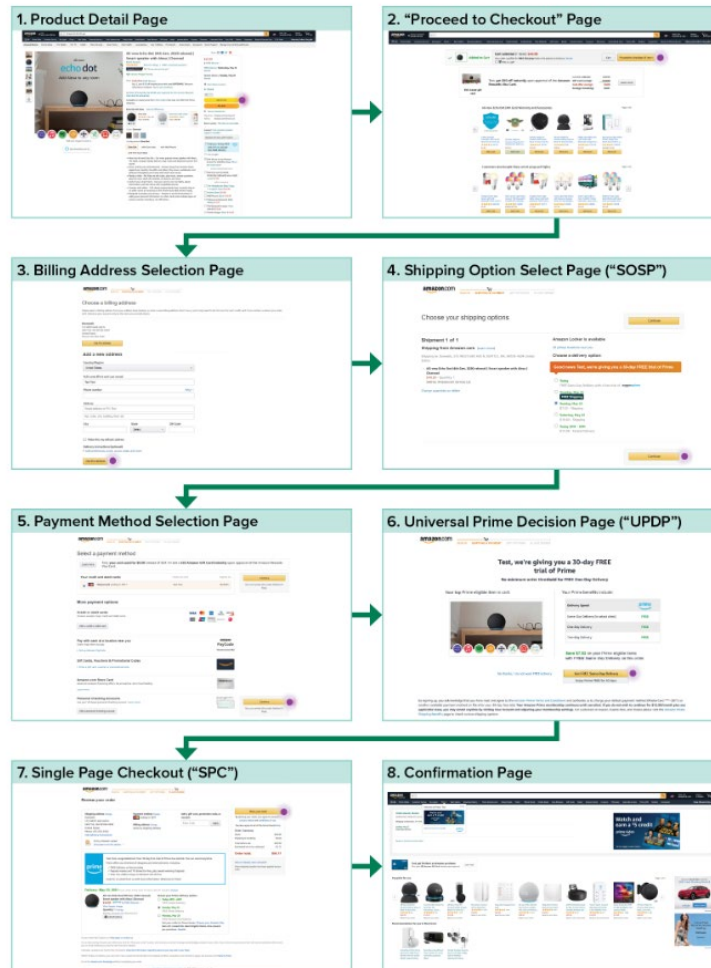


Figure 3: MPP Checkout on Desktop

93. The FTC asked me to assume that the flowchart below illustrates the MPP checkout on a mobile device.



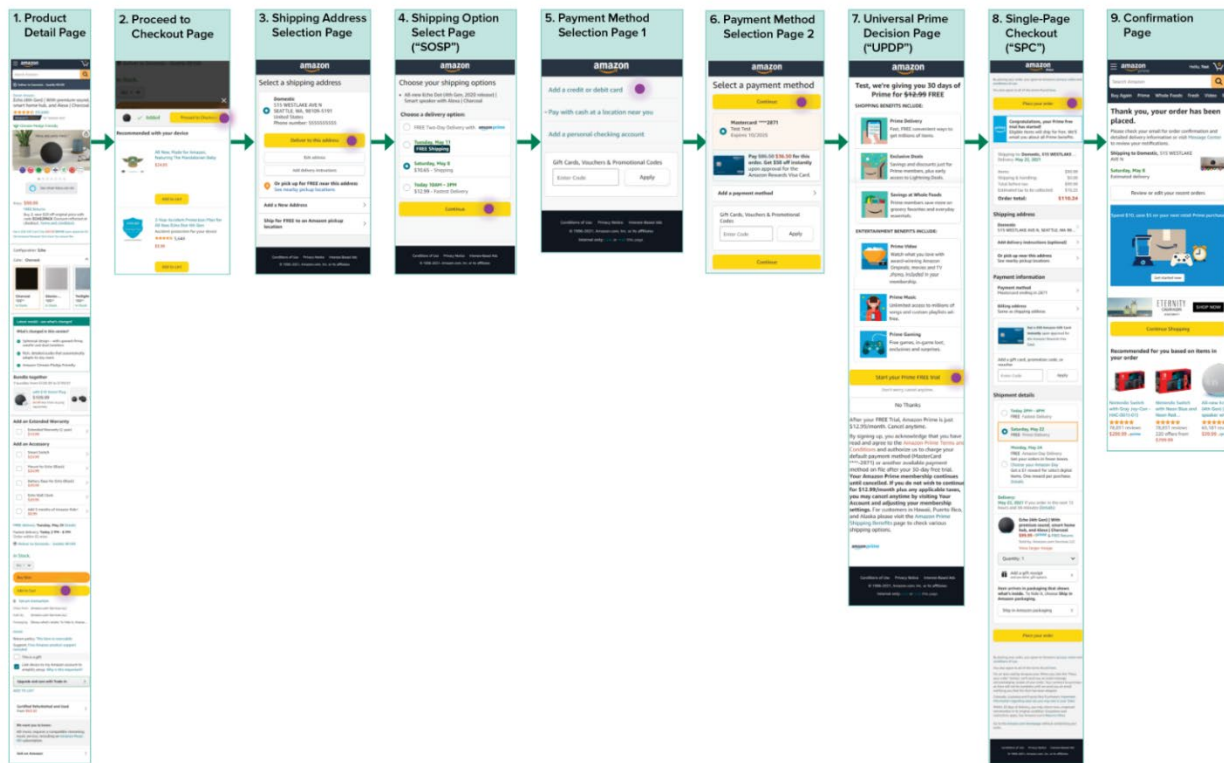


Figure 4: MPP Checkout on Mobile

### TrueSPC (Desktop Only)

94. The FTC asked me to assume that a consumer purchasing a product on Amazon through the TrueSPC checkout on a desktop device can add the product to their cart by selecting the “Buy Now” or “Add to Cart” and “Proceed to Checkout” yellow (or orange) buttons. Consumers with a saved address and payment selection are directed to the UPDP, then the “TSPC,” which is the last page in the process where consumers can place their order. In other words, the TSPC assumes the same role as the SPC in the MPP checkout. Consumers without saved payment and address information proceed directly to TSPC after clicking “Buy Now” or “Proceed to Checkout.”
95. The FTC asked me to assume that Attachments E and F reflect TrueSPC checkout.
96. The FTC asked me to assume that the flowchart below illustrates the TrueSPC checkout.

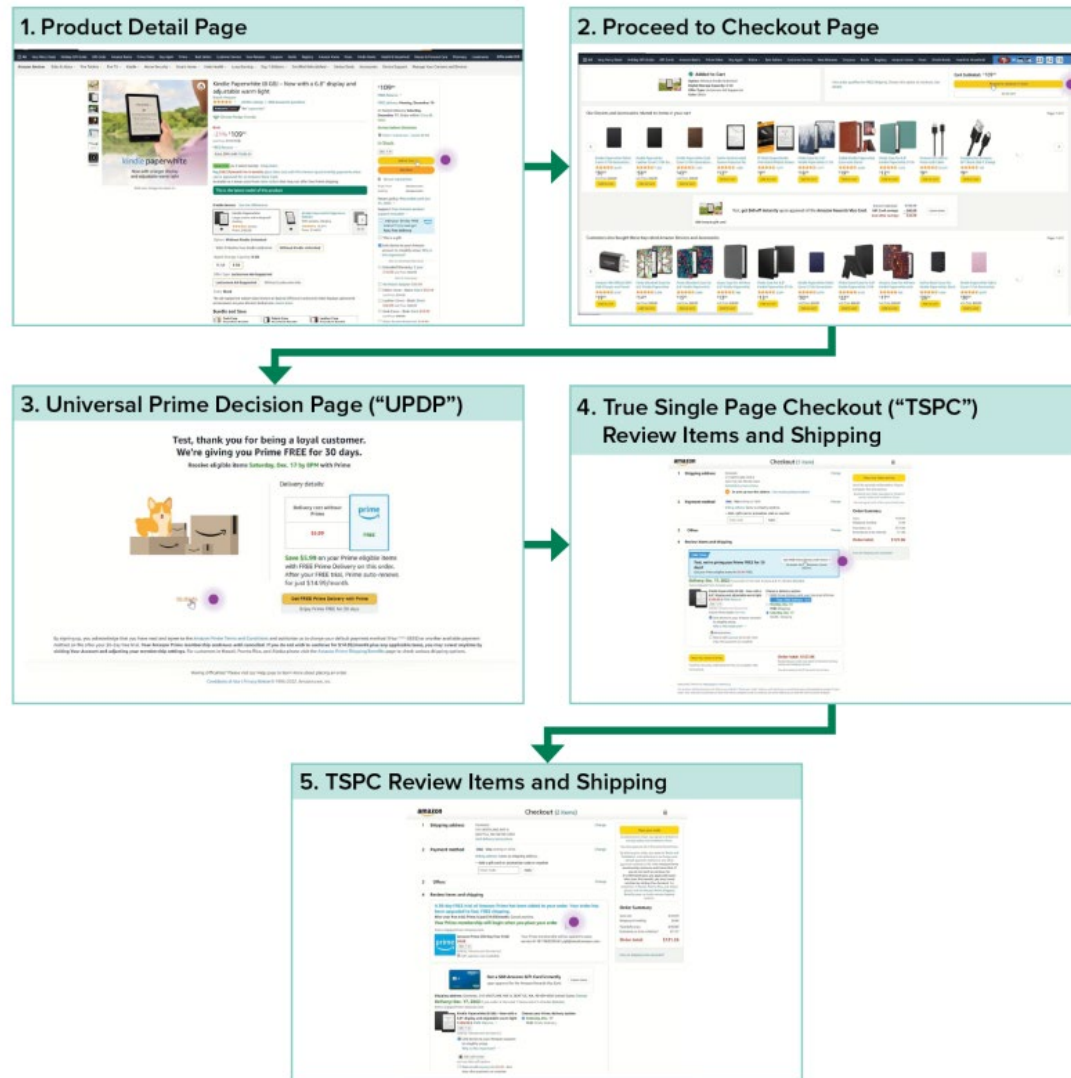


Figure 5: TrueSPC Checkout on Desktop

#### a) Overview and Cognitive Walkthrough of the SOSP on Desktop and Mobile Devices

97. The FTC provided me with the screen captures for the Shipping Option Select Page (SOSP) on desktop and mobile devices in this section and in **Attachments B (pages 9, 16, and 24 for desktop; pages 36, 38, and 40 for mobile) and C (pages 9, 16, and 24 for desktop; pages 37 and 39 for mobile)**. The FTC asked me to assume that Attachment B reflects Prime free trials; Attachment C reflects Prime Hard Offers.
98. The FTC asked me to assume that the SOSP only appears in the MPP process.
99. The screen captures I was provided by the FTC show the following on the SOSP. The SOSP provided consumers with an option to "[c]hoose [their]

shipping options.” On the right side of this page, Amazon provided a list of shipping speed options, including an option (usually the first option in the list) that generally stated “FREE Same-Day Delivery with a free trial of Amazon Prime,” with an orange box right above stating “Good news, we’re giving you a 30-day FREE trial of Prime.” My understanding is that Amazon has stated that consumers never had the “Prime” option pre-selected. Ultimately, the consumer proceeded through SOSP by choosing a shipping option and then clicking a yellow/orange button.

100. The FTC asked me to assume that the image below reflects a representative image of the SOSP.

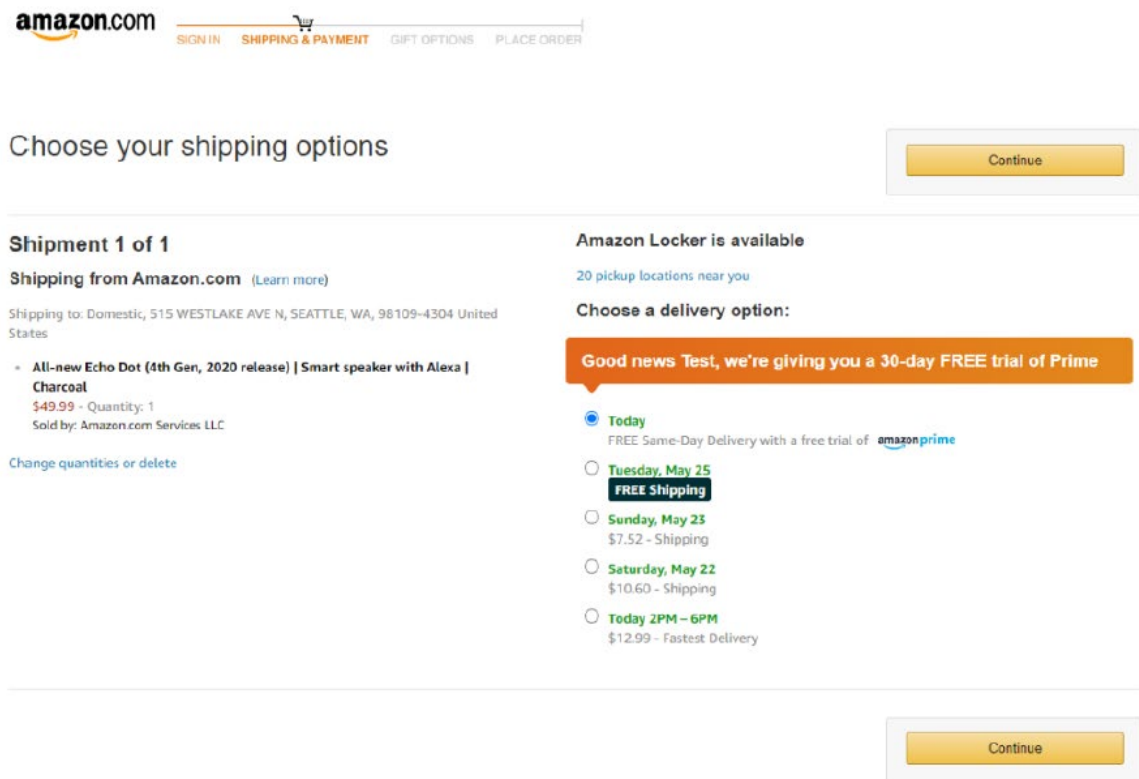


Figure 6: SOSP on Desktop

101. The SOSP offers consumers Prime even though it does not present any information on the terms of a Prime subscription. The price and renewal terms are *entirely* absent from the SOSP. The only Prime-related information on the SOSP are the orange box above the Prime shipping option that states “Good news [name], we’re giving you a 30-day FREE trial of Prime” and the reference to a shipping option associated with Prime free trial, which appears as the first shipping option at the top of the list. A consumer encountering the SOSP therefore has no indication about the terms of a Prime subscription but is still offered to enroll. Additionally, the placement of the Prime shipping

option at the first on the list of options makes users more likely to proceed with that option and subsequently enroll in Prime. Even though users who select the Prime free shipping option do not automatically enroll in Prime, consumers may not understand that fact; in other words, consumers may think they have enrolled (or that Amazon has enrolled them—i.e., “given” them Prime) when they choose the Prime shipping option. Additionally, consumers who see the Prime “offer” without accompanying terms likely believe that there is no cost to the subscription offer or the Prime free shipping offer.

102. The “Good News [Name]...” framing uses Emotional and Sensory Manipulation to make consumers feel more positively inclined towards Prime, as though they are special in getting this deal. Also, the word “FREE” is emphasized and a user may focus on that word and assume there are no costs associated with this deal at the present or at a future time.
103. The SOSP on mobile presents very similar design issues as on desktop. Though there is a reference to “FREE Same-Day Delivery with Amazon Prime,” the SOSP on mobile does not display the cost or renewal terms of a Prime subscription. Consumers who therefore select the Prime shipping option are not informed as to the terms of the subscription. The Prime shipping option also appears at the top of the list of shipping options here. This particular design issue is magnified given the smaller screen.
104. The FTC provided me with the following screen capture of the SOSP on a mobile device.

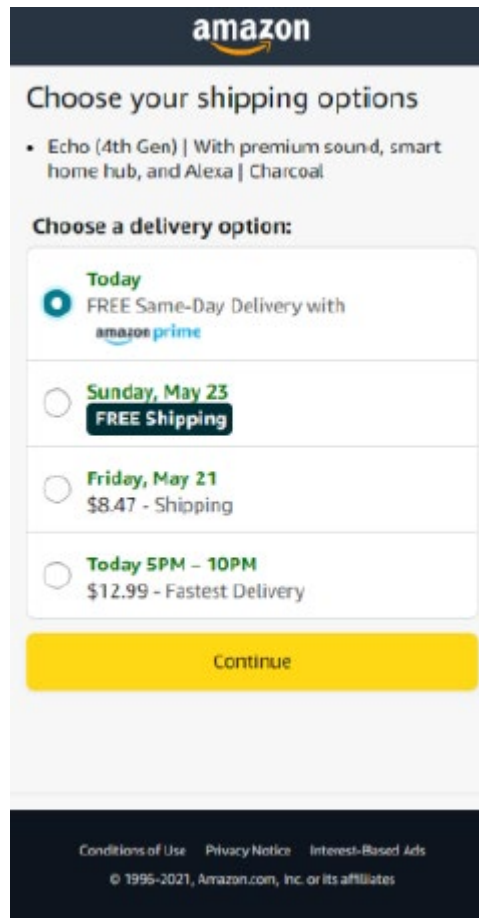


Figure 7:  
SOSP on  
Mobile

105. Though the FTC understands that consumers who select the Prime shipping option on the SOSP are not immediately enrolled in Prime, the SOSP's reference to Prime can already confuse consumers going through the checkout process to purchase a product.

**b) Overview and Cognitive Walkthrough of the UPDP on Desktop and Mobile Devices**

106. The FTC provided me with the screen captures for the UPDP on desktop and mobile devices in this section and in **Attachments B (pages 18 for desktop; pages 39 for mobile) and C (pages 16 for desktop; page 39 for mobile).**
107. The Universal Prime Decision Page (UPDP) appears in the MPP and TrueSPC online checkout flows. Amazon has used various versions of the desktop UPDP. *See, e.g., Attachments B, C, H, I, F.*
108. The screen captures and videos the FTC provided me show the following on the UPDP. Generally, the UPDP includes a message at the top stating that Amazon was “giving” the consumer a free trial of Prime. The middle of the page often contains graphics or large text promoting the benefits of Prime, such as free shipping and the potential savings on shipping for the

consumer's purchase.

109. Consumers who are shown the UPDP are not able to complete their product purchase without clicking one of two options toward the bottom of the UPDP page, which would either accept or decline a Prime subscription. The accept, or enroll, option is a yellow/orange button that reads “Get FREE Same-Day Delivery,” or a variant **Attachments B and H**. Clicking the enroll button would immediately enroll the consumer in Prime. The only other way to proceed through UPDP without enrolling in Prime is to click on the decline option, which is usually a blue hyperlink (though it appears occasionally as a button) that reads, for example, “No thanks, I do not want fast, free shipping” or “No thanks.” **Attachments B and H**.
110. The FTC asked me to assume that, on some UPDP pages, the fact that a Prime free trial would automatically renew and convert into a paying membership, and the price of that memberships, was only disclosed in small print beneath the enroll and decline options—as shown in **Attachments B, C, and H**. On others, the information was at the top of the page or near the enrollment button.
111. In some versions, once the consumer opts into Prime via the UPDP, the subsequent page in the checkout process—the SPC—displays the text “[Name], congratulations! Your 30-day free trial of Prime has started. You can cancel anytime” appears, along with a list of Prime benefits. **Attachment D**.

112. The FTC provided me the image below which depicts the UPDP on a desktop.

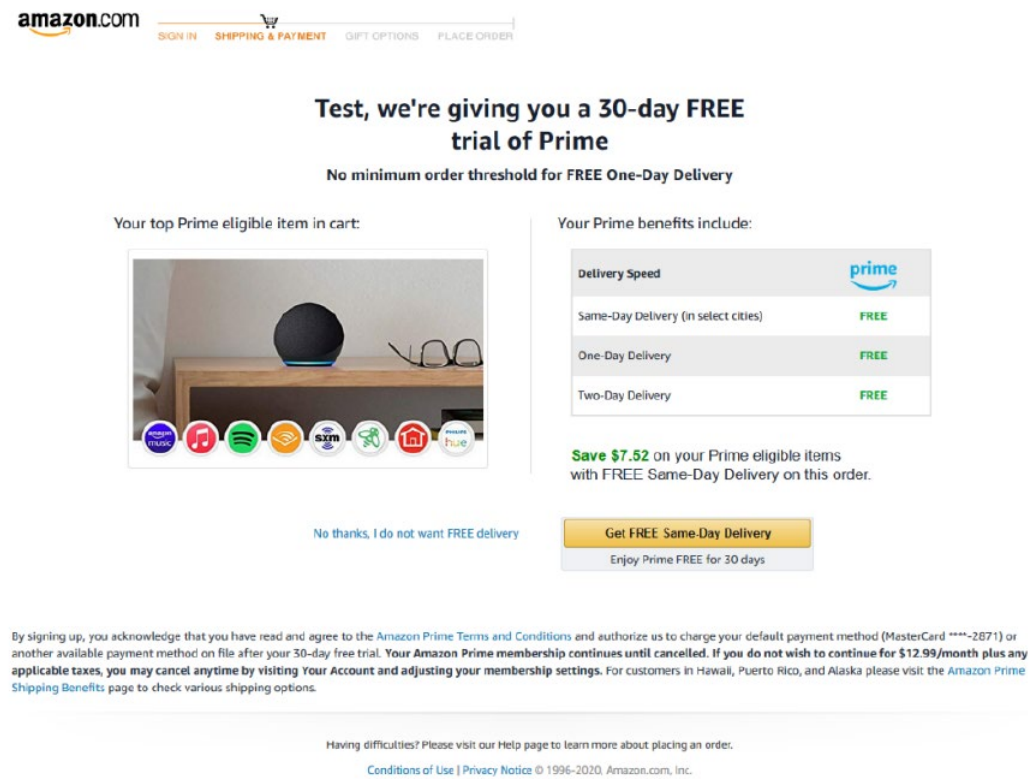


Figure 8: UPDP Free Trial on Desktop

113. The FTC provided me with the following screen capture of a UPDP on a mobile device.



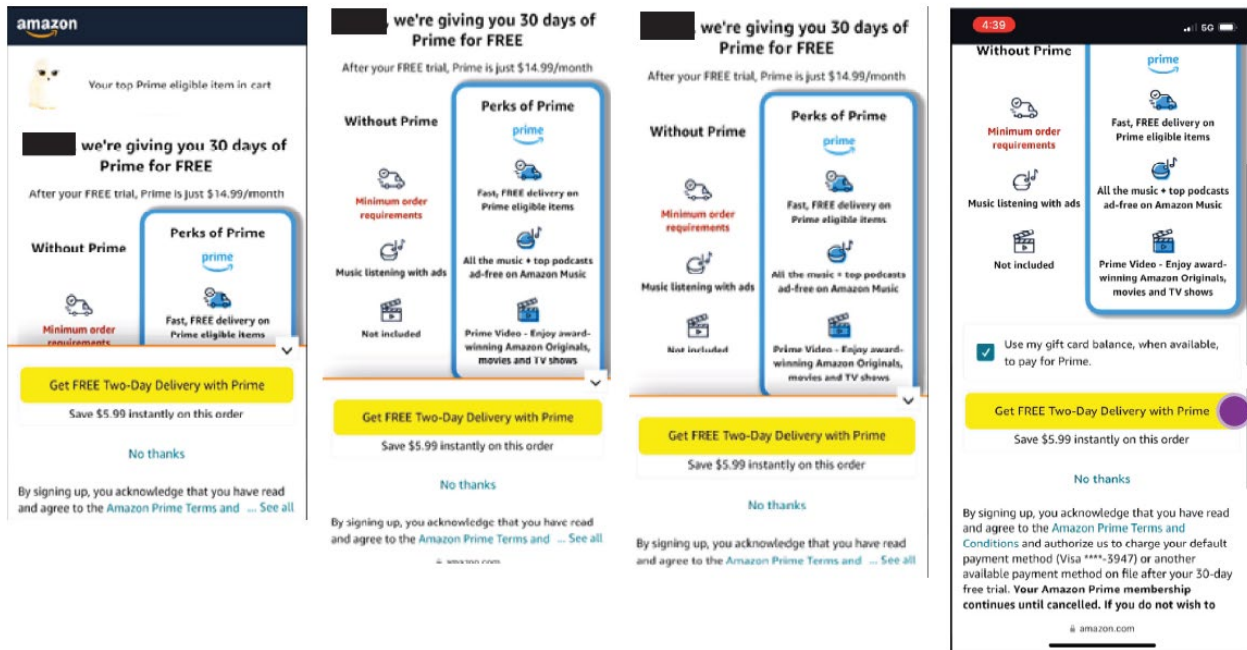


Figure 9: UPDP Free Trial on Desktop

114. The FTC asked me to assume that the UPDP on mobile is similar to the UPDP on desktop, with a vertical layout for the enrollment buttons or decline options.
115. The UPDP has some of the most problematic designs in the online product checkout process. It appears in the middle of the MPP checkout, and it can appear in middle of the TrueSPC checkout as well (for consumers have saved address and billing information). As explained below, the design of the UPDP is particularly manipulative as it contains multiple dark patterns that act in tandem to steer consumers to sign up for Prime without giving them complete information as to the subscription (cost of a subscription and renewal terms, for instance) and often without clearly telling them that they even have the option to enroll in, or decline, a Prime membership.
116. The UPDP essentially interrupts the consumer's shopping process by presenting them with information on a subscription service—Prime—separate from the product they are buying. The only information that appears on the UPDP *and* is salient to a consumer's goal of making a purchase is the "fast, free" shipping that comes with a Prime subscription. The FTC asked me to assume that consumers without a Prime-eligible item in their cart will still see a version of the UPDP (called "order agnostic") that promotes Prime benefits (for example, Prime Video) that are completely unrelated to the product purchase.



117. Given its position within the checkout process, users can misunderstand the UPDP, or not pay much attention to it, because the only information that the UPDP offers in connection with the consumer's primary goal—to complete a purchase—is whether the user wants “fast, free” shipping with Prime. Because the UPDP is not clearly related to the consumer's primary task of placing an order on Amazon, consumers are very likely to rely on quick System 1 thinking and not carefully read this page, especially the terms and conditions, in order to move onto the next step in placing their order [6,41,63,69,88].
118. In other words, without the UPDP, the online product checkout flow would still function for users without interrupting them while they are purchasing a product. The other pages in the MPP and TrueSPC flows, by contrast, all advance the user towards their goal of completing their purchase (with the exception of SOSP, which may be a redundant page.) For instance, the other pages collect necessary information for the purchase, such as delivery address, payment information, shipping preferences and methods, and even the amount of product the user wants. The UPDP is therefore unnecessary to placing an order for a product, and the interruption is an example of the dark pattern, Nagging.
119. The disclosures about the price and recurring nature of a Prime subscription and the fact that a user is being asked to enroll in a Prime subscription on the UPDP page are easily missed because this information is included at the bottom of the page in the smallest, least prominent front on the page, buried within other terms and conditions, which consumers frequently do not read. Therefore, even when a consumer realizes that the UPDP accept button would enroll them in a Prime subscription, they would miss the material terms, such as the cost and renewal terms, of the subscription unless, in most cases, they read the small-print terms and conditions below the accept button and decline link.
120. The UPDP capitalizes on the consumer's reliance on System 1 thinking. It does not make the subscription or its terms (cost and renewal terms) easy to notice on the page. In some versions of the UPDP, the only location where Amazon discloses the cost and the renewal terms of a Prime subscription is at the bottom of the page in the terms and conditions section, which consumers are known to miss or not read [6,41,63,69,88]. The terms and conditions are in the smallest front on the page, and a consumer needs to look below the action button (“Get FREE Same-Day Delivery”) to even see the terms and conditions section. Some consumers might not even realize that UPDP pertains to Prime. Importantly, the word “Prime” often does not appear in either the accept or the decline options, meaning consumers may not realize that the options even pertain to Prime. Sometimes, Prime is in the accept button, but not in a way that makes clear that clicking the button enrolls in Prime (*e.g.*, “Get Free Two-Day Delivery with Prime.”) The visual

manipulation is more pronounced on a mobile device where a user has to scroll past the options to accept or decline the Amazon Prime enrollment in order to read over the terms and conditions. *See Attachment D.*

121. Another manipulative effect on the UPDP page is the emphasis on the word “free,” which Amazon often emphasizes by using all-caps letters, bold font, and repetition. In fact, the word “FREE” can appear at least nine times on the UPDP alone. This manipulative technique, known as visual prominence or visual manipulation—an Interface Interference dark pattern—draws the user’s attention to specific elements on the page that the provider wants consumers to see over other information, such as the terms and conditions. Amazon draws on emotional manipulation by constantly using and emphasizing the word “FREE” to make the user feel like they are personally being rewarded with a special deal. The constant repetition of the word “FREE” also creates a cognitive dissonance for the consumer, who may subconsciously assume, as a result of this manipulation technique, that they will not be charged for the shipping and may miss the cost of the subscription.
122. Similarly, the wording of the decline option elicits negative feelings from consumers. For instance, the option to decline Amazon Prime Delivery is often worded as “No thanks” or “No thanks I do not want fast, FREE delivery,” which could lead users to click on the enroll option to avoid feeling shame and the sense that they are not being financially sensible and potentially losing money on shipping.
123. Amazon also uses visual manipulation in the design of the options to accept or decline Prime, including the positioning, framing, sizing, and wording of the options. The enroll option always appears in the form of a yellow/orange button, usually with a gray shadow underneath, giving the impression of a double-stacked button. The decline option is often a blue hyperlink with no framing of any kind. The enroll option is visually brighter and more appealing than the decline one. The visual asymmetry between the two options creates an imbalance that favors the enroll option. Users are therefore naturally more drawn to the visuals of the enroll option than to those of the decline option.
124. The double-stacked button for the enroll option can also be confusing to consumers because it looks like the gray button is clickable and presents a third option, though it is not. *See Attachment D.*
125. The position of the options also plays an important role. The enroll button on UPDP desktop is located on the right, while the decline option is on the left. Moreover, Amazon’s use of a yellow/orange button located on the right of the screen for the enroll option is *particularly* manipulative given the significance of those visual choices within the context of its online checkout

flow. The button that gets users to the next stage of their shopping experience is always a yellow button, often located on the right of the screen. For example, “Add to Cart,” “Proceed to Checkout,” “Use this address,” “Continue,” and “Place your order” are all yellow buttons in the checkout mostly located on the right-hand side of the screen. *See Attachments B (MPP Checkout) and C (TrueSPC Checkout).*

126. Even more troubling is the fact that the consumer must either accept or decline the Prime subscription (often disguised as “fast, free shipping”) to continue their shopping experience. This is, in essence, a Forced Action dark pattern. Given that the consumer’s primary goal is to complete their product purchase, they are more likely to be swayed by the manipulative elements on the page and miss the cost and recurring charges disclosures and click on the button to enroll in Prime without realizing what the outcome of that action is. A consumer would likely react differently if they were in a process specifically to enroll in Prime and their primary goal was to enroll in Prime. Even then, the consumer would need to look carefully at the page to find the terms and conditions, which are generally tucked in a small font at the bottom of the page.
127. The “hard offer” UPDP is even worse because upon selecting the “Get FREE Same-Day Delivery” option that enters the consumer in a Prime subscription, that consumer is immediately enrolled in Prime and *billed* for the subscription without going through anything like what a consumer would expect from an online shopping “checkout” page. **Attachment C (page 18).** Where the free trial version gives a consumer time to realize they have subscribed in Prime and cancel before being billed, the hard offer has immediate financial consequences.
128. The design of the UPDP for a mobile device is even more manipulative than the desktop version. Like the desktop UPDP, there is insufficient information with respect to the Prime subscription on the mobile UPDP. **Attachment B, Mobile UPDP.** One particularly bad design that hides information from users capitalizes on the fact that users need to scroll down the page, past all of the information regarding Prime benefits, to *see* Prime’s terms and conditions, where Prime’s cost and renewal terms generally are buried. **Attachment Q.** Figure 9, which the FTC provided me, illustrates this well as it shows the terms and conditions that appear as the user scrolls down the page, even though the enroll and decline options are available without the scrolling. This technique, known as a “sticky footer,” therefore hides key information from users using a mobile device. Therefore, only users who take time to scroll past these buttons are going to notice the terms and conditions in the smallest font on the page. This is easily missed.
129. The design of the enroll and decline options is also worse on a mobile device to maximize signups regardless of user intent. Specifically, the enroll

option—which sometimes appears as a double-stacked yellow/orange button with a shadow box and sometimes appears without the shadow—is prominently featured above the decline option, which is a blue hyperlink with a smaller font, almost blending in with the terms and conditions. The vertical stacking of the enroll and decline options, using an Interface Interference technique, makes it harder for the user to find the decline option and makes it more likely that the user will select the enroll button without realizing what the consequences of that action are, especially given that the user has to select one of either option.

130. The word “free” is also more emphasized on the mobile UPDP, given the small screen space. For instance, “free” appears four times on Figure 9, often in bold and in all-caps, and the user does not need to scroll at all to see the four instances.

**c) Overview and Cognitive Walkthrough of the Ship Option Select Page Prime Decision Page (SOSP PDP)**

131. The FTC asked me to assume that the SOSP PDP page appeared after the SOSP and payment selection page (where a consumer confirmed their payment method for their purchase) for consumers who selected the “Prime” shipping option on SOSP. The SOSP PDP required consumers to choose between the option to “Start your FREE trial” (or other language), which continues to enroll the consumer in Prime if the consumer selected the Prime shipping option in the SOSP, and the option to decline (which avoids a Prime membership).
132. The FTC asked me to assume that the SOSP PDP generally functioned in the same manner as the UPDP, presenting consumers with two options, one of which enrolled them in Prime and the other did not. Consumers had to pick one of the two options to proceed with their product purchase.
133. The FTC asked me to assume that if the consumer selected the Prime option in the UPDP or SOSP PDP, the banner on the final SPC page read “congratulations! Your 30-day free trial of Prime has started. You can cancel anytime,” and the consumer was enrolled in a Prime free trial even if they did not complete the checkout process by clicking “Place your order” on the last page.
134. The FTC asked me to assume that the image below reflects a representative image of the SOSP PDP.

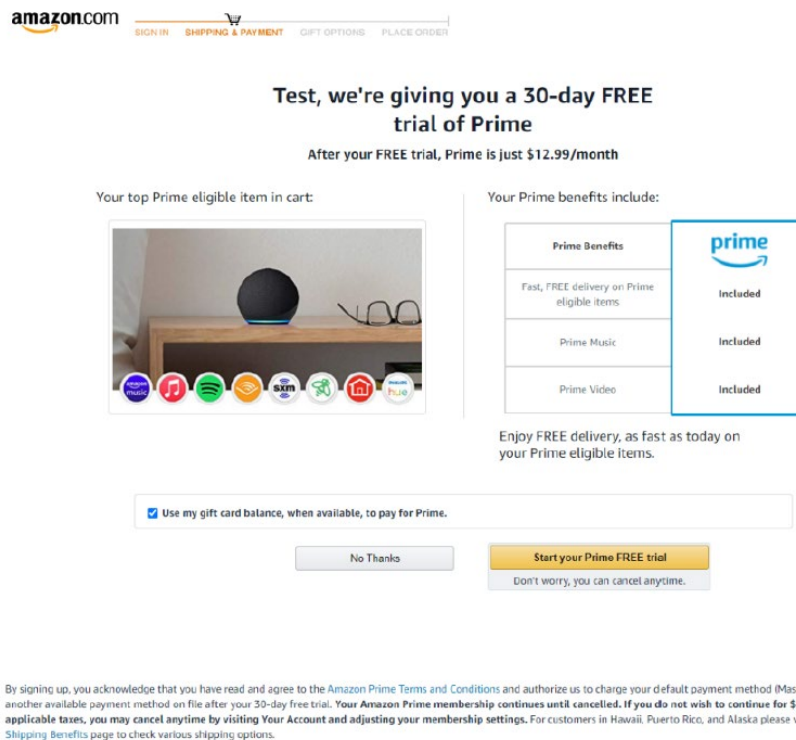


Figure 10: SOSP PDP on Desktop

135. The SOSP PDP page is virtually indistinguishable from the UPDP and presents the same issues as the ones laid out in Section VI(X) on both desktop and mobile devices. *Compare Attachment B, page 11* (SOSP PDP) with *Attachment B, page 18* (UPDP).

#### d) Overview and Cognitive Walkthrough of the Single Page Checkout (SPC)

136. The FTC provided me with the screen captures for the SPC on desktop and mobile devices in this section and in **Attachments B** (pages 25-26 for desktop; pages 42 for mobile) and **C** (pages 25-27 for desktop; page 41-42 for mobile).
137. The screen captures I was provided by the FTC show the following on the SPC. The SPC is the last page of the MPP checkout flow, where a consumer can place their order on the Amazon website. The SPC on desktop had three sections: 1) the “Review your Order” section, which presented the previously-provided shipping address and payment method and billing address, and a space to enter a gift card, promotion code, or voucher; 2) a Prime free trial box (which Amazon calls the “SPC Stripe”), where a consumer could select “Try Prime FREE for 30 days;” and 3) a delivery option selection, with various shipping options, including one (which Amazon called the “SPC ISOA”) for “FREE Same-Day Delivery with your

free trial of Prime” with “Fast, FREE Delivery” and Prime’s logo.

138. The FTC asked me to assume that the image below reflects a representative image of the SPC.
139. The FTC asked me to assume that if the consumer selected the “Try Prime FREE for 30 days” button in the SPC Stripe, the text in the box would change to read “A 30-day FREE trial of Amazon Prime has been added to your order. Your order has been upgraded to fast, FREE shipping” and the consumer would be enrolled in a Prime free trial once they clicked on “Place your Order.”
140. The FTC asked me to assume that if the consumer selected the “FREE Same-Day Delivery with your free trial of Prime” SPC ISOA, the consumer would be enrolled in a Prime free trial once they clicked on “Place your order.”
141. The FTC asked me to assume that the image below reflects a representative image of the SPC on a desktop.

**amazon.com** SIGN IN SHIPPING & PAYMENT GIFT OPTIONS PLACE ORDER

### Review your order

**Shipping address** [Change](#)  
 Domestic  
 515 WESTLAKE AVE N  
 SEATTLE, WA 98109-4304  
 United States  
 Phone: 555 555-5555  
[Add delivery instructions](#)

**Payment method** [Change](#)  
 ending in 2871

**Billing address** [Change](#)  
 Same as shipping address

**Add a gift card, promotion code, or voucher**  
 Enter Code

**Place your order**  
 1 By placing your order, you agree to Amazon's [privacy notice and conditions of use](#).  
 You also agree to all of the terms found [here](#).

**Order Summary**  
 Items: \$49.99  
 Shipping & handling: \$7.52  
 Total before tax: \$57.51  
 Estimated tax to be collected: \$5.89  
**Order total: \$63.40**

[How are shipping costs calculated?](#)

**FREE TRIAL**  
 2 **Test, we'd hate for you to miss out on unlimited fast, FREE delivery**  
 Save \$7.52 on eligible items in this order and enjoy unlimited fast, FREE delivery when you try Prime FREE for 30 days.

**3 Try Prime FREE for 30 days**  
 No hassle. No commitments. Cancel anytime.

**Delivery: May 24, 2021** if you order in the next 14 hours and 32 minutes [\(Details\)](#)

**All-new Echo Dot (4th Gen, 2020 release) | Smart speaker with Alexa | Charcoal**  
**\$49.99 & FREE Returns**  
 Amazon Prime eligible [Join now](#)  
[View larger image](#)  
 Quantity: 1 [Change](#)  
 Sold by: Amazon.com Services LLC  
[Add gift options](#)

**4 Choose a delivery option:**  
☐ **Today**  
 FREE Same-Day Delivery with your free trial of Prime  
**Fast, FREE Delivery**   
☐ **Wednesday, May 26**  
 FREE Shipping  
☒ **Monday, May 24**  
 \$7.52 - Shipping  
☐ **Sunday, May 23**  
 \$10.60 - Shipping  
☐ **Today 2PM - 6PM**  
 \$12.99 - Fastest Delivery

**5**

Do you need help? Explore our [Help pages](#) or [contact us](#)

For an item sold by Amazon.com: When you click the "Place your order" button, we'll send you an email message acknowledging receipt of your order. Your contract to purchase an item will not be complete until we send you an email notifying you that the item has been shipped.

Colorado, Louisiana and Puerto Rico Purchasers: [Important information regarding sales tax you may owe in your State](#)

Within 30 days of delivery, you may return new, unopened merchandise in its original condition. Exceptions and restrictions apply. See Amazon.com's [Returns Policy](#)

Go to the [Amazon.com homepage](#) without completing your order.

Conditions of Use | Privacy Notice © 1996-2020, Amazon.com, Inc.

Figure 11: SPC on Desktop



142. The SPC presents consumers with two Prime detours: (1) the SPC Stripe, which appears as a blue box on desktop, and (2) the delivery (or shipping) options (containing the SPC ISOA).
143. The design of the SPC reflects many of the same techniques used on the UPDP (and SOSP PDP) pages to hide the terms of a Prime subscription from users as much as possible.
144. Specifically, the terms of the Prime subscription are largely missing from at least some versions of the SPC page. The SPC Stripe (the blue box) displays “[Name] we’d hate for you to miss out on unlimited fast, FREE delivery” and includes a button labelled “Try Prime FREE for 30 days” with, underneath it “No hassle. No commitments. Cancel anytime.” The SPC Stripe also includes how much the consumer would be saving in shipping costs by electing to “[t]ry Prime.” But nowhere are the cost and renewal terms of Prime disclosed. Similarly, the delivery options include a Prime option, listed as the first one, that reads “Free Same-day Delivery with your free trial of Prime.” The price, end period of the free trial, and renewal terms of Prime are not visibly displayed near that Prime detour option either, or in the terms and conditions section at the bottom of the screen and near the “Place your order” yellow button. Consumers, therefore, do not have complete information on the basic terms of Prime prior to selecting the “Try Prime FREE for 30 days” button or selecting the Prime shipping option.
145. Similar to the UPDP (and SOSP PDP), the SPC emphasizes the word “free,” which appears at least six times in connection to Prime on some versions of the SPC. *See, e.g.*, Figure 11. This use of the visual prominence technique draws the user’s attention to a benefit of the Prime subscription (free shipping), even though the user cannot see the terms on the page and may not realize that selecting free shipping enrolls them in a Prime subscription. *See supra*, Section VI(b).
146. Amazon does not prominently display the terms and conditions of a Prime subscription even after a consumer selects the Prime button option in the SPC Stripe or the Prime shipping option. Amazon visually emphasizes the Prime benefit— “[a] 30-day FREE trial of Amazon Prime has been added to your order. Our order has been upgraded to fast, FREE shipping”—by using eye-catching blue text on a white background. However, the material terms included in “After your free trial, Prime is just \$12.99/month. Cancel anytime” are only disclosed in a smaller font and in black, making them easy to miss. The fact that Amazon displays “\$0.00” in the consumer’s basket could also confuse consumers because it emphasizes the cost of the free trial—but omits the cost of the Prime subscription *after* the free trial. The Prime free trial therefore appears like a product in the cart with a price tag of

\$0.00, likely misleading consumers into thinking Prime is not going to cost them anything.

147. Similarly, Amazon buries the material terms of a Prime subscription in the terms and conditions section underneath the “Place your order” button on the top right of the SPC.
148. The FTC provided me with the screen shot below showing what the screen looks like after a user selects a Prime detour on the SPC on a desktop device.

The screenshot shows the Amazon.com checkout page titled "Review your order". At the top, there are links for "SIGN IN", "SHIPPING & PAYMENT", "GIFT OPTIONS", and "PLACE ORDER". The main content is divided into several sections:

- Shipping and Payment:** Includes fields for shipping address, payment method (ending in 2871), and billing address. There is a "Place your order" button on the right.
- Prime Membership Upgrade:** A blue banner states: "A 30-day FREE trial of Amazon Prime has been added to your order. Your order has been upgraded to fast, FREE shipping." Below this, it says "After your free trial, Prime is just \$12.99/month. Cancel anytime." The Prime logo is shown with the price "\$0.00".
- Items Shipped:** Lists "All-new Echo Dot (4th Gen, 2020 release) | Smart speaker with Alexa | Charcoal" for \$49.99. It also shows the delivery date as "May 23, 2021" and a "Choose your Prime delivery option" section with radio buttons for "Today 2PM - 6PM" and "Sunday, May 23".
- Order Summary:** A table on the right shows the order total: Items (\$49.99), Shipping & handling (\$0.00), Total before tax (\$49.99), Estimated tax (\$5.12), and a final "Order total" of \$55.11.
- Terms and Conditions:** At the bottom, there is a section with links to "Help pages", "Privacy Notice", and "Returns Policy".

Four numbered callouts are present: 1 points to the Prime upgrade banner, 2 points to the "Place your order" button, 3 points to the delivery options, and 4 points to the "Add a gift receipt" button.

Figure 12: SPC on Desktop after User Enrolls in Prime

149. The SPC becomes further problematic if a user clicks the “Try Prime FREE





shopping experience in this checkout flow (first, the SOSP, then the UPDP or SOSP PDP, and then the SPC/SPC Popover.) This manipulative design called nagging, which is to ask the same thing over and over again, wears the user down to take an action that benefits the service provider. The SPC Popover also uses visual manipulation and confirmshaming to emphasize the enroll option—which appears as a yellow button with the words “Join Prime for Fast, FREE Delivery”—and de-emphasize the decline option—which appears as a grey, less eye-catching button with the confirmshaming “no thanks” button. Although the “Join Amazon Prime for \$12.99/month” is in a larger font than the terms and conditions, which are easy to miss, this is still confusing since the button to enroll emphasizes joining for free. Consumers may still be confused about whether Prime costs money to join and when they will be charged.

153. The design of the SPC on a mobile device is, as for all the mobile screen captures, worse than the desktop, as users cannot easily access the terms of the Prime subscription even though the Prime detours are visually prominent.
154. The design of the SPC on a mobile device after the user selects Prime also does not make it clear what the terms and conditions of a Prime membership are. **Attachment B, page 41.**
155. Even though Amazon includes the cost and renewal terms of Prime on the SPC mobile after a user has enrolled, the terms are hidden. In Attachment G, the terms of the Prime subscription are included in the smallest print on the page along with the privacy notice and conditions of use links, making it easy for a user to miss. They are also included in the box underneath the “Place your Order” button, in small print.
156. A user does not have an intuitive, easy way to remove the Prime subscription on the SPC mobile. To remove the subscription, the user has to reduce the item quantity by scrolling down on their screen, select the “quantity” dropdown menu underneath “Amazon Prime” and select “0.” The information is also confusing since the Amazon Prime subscription is included as shipping an item “Shipment 1 of 2” which again may make a user believe this is akin to a physical product. Finally, the price and recurring charges are again always displayed in a very small font on the page which is harder to notice on a mobile device where the screen is smaller. There is an on-screen message that “Amazon Prime (30-day Free Trial) is applied to your account” followed by a non-readable code. This could alert the user that some action related to Prime has occurred but it does not tell the user that this is a subscription they are enrolled in and that they will be charged after 30 days and on a monthly basis unless they cancel. In other words, the same dark patterns are being used on mobile and are more likely to result in enrollments that may have been unintentional since users are likely to be paying even less attention on a mobile device [21,33,64,82].

157. The SPC Popover on mobile is also worse than the one on desktop. The terms of a Prime subscription are only included in the smallest font size at the bottom of the screen, so that the user has to scroll down to see them. The enroll button, labelled “Join Prime” and located above the terms and conditions section, is visually emphasized through color and location, while the decline button is gray and appears second.

**e) Overview and Cognitive Walkthrough of the True Single Page Checkout (TSPC)**

158. The FTC asked me to assume that the TSPC is the final page of the TrueSPC checkout process. The TSPC contains four vertically stacked “sections” that expand (and minimize) depending on the consumer’s interaction with that particular section.
159. The first section is the “shipping address,” where the consumer can change their shipping address. The second section is the “payment method,” where the consumer can change the payment method and add a gift card, promotion code, or voucher.
160. The third section is the “offers” section, which presents some consumers with a Prime detour. There are various versions of the “Offers” section. See **Attachment E**. In general, that section expands to read: “try Prime FREE for 30 days and save [a certain amount of money] on this order in both shipping and savings. Cancel anytime.” Right below, “After your trial, Prime is only \$14.99/month” is displayed in smaller print. There is also a summary of Prime benefits in the form of a chart, and two buttons at the bottom of this section reading “Not right now” and “Sign up for Prime.” Selecting “Sign-up for Prime” enrolls the consumer in a Prime free trial. My understanding is that consumers sometimes see what Amazon refers to as a “modal” pop-up on TSPC rather than the “Offers” panel. The “modal” pop-up is substantially similar to the “Offers” panel.
161. The fourth and last section of TSPC is the “review items and shipping” section, which contains, among other things, shipping speed options. If the consumer is not a Prime subscriber, the “review items and shipping” section presents them with a Prime detour in a blue banner at the top of the section, which is effectively the same as the “SPC Stripe” described above. The banner contains a button that reads “Get FREE Prime Delivery with Prime,” which, if selected, changes to “A 30-day FREE trial of Prime has been added to your order. Your order has been upgraded to fast, FREE shipping” and would enroll the consumer in Prime once they complete their purchase through the online checkout process.
162. The FTC asked me to assume that the shipping speed options also present an opportunity for consumers to enroll in Prime, as one of the shipping options is “FREE Prime Delivery with your free trial” (which is effectively the same as the SPC ISOA described above). If a consumer selects this option, the

screen “updates” to remove all the other shipping options.

163. The FTC asked me to assume that if a consumer adds Prime to their order on the TSPC, the only way for the consumer to complete their purchase without enrolling in Prime free trial would be to change the “quantity” of Prime orders from 1 to 0 where the SPC Stripe was.
164. The TSPC does not exist on a mobile format.
165. The FTC asked me to assume that the image below reflects a representative image of the TSPC’s Offer section on desktop.

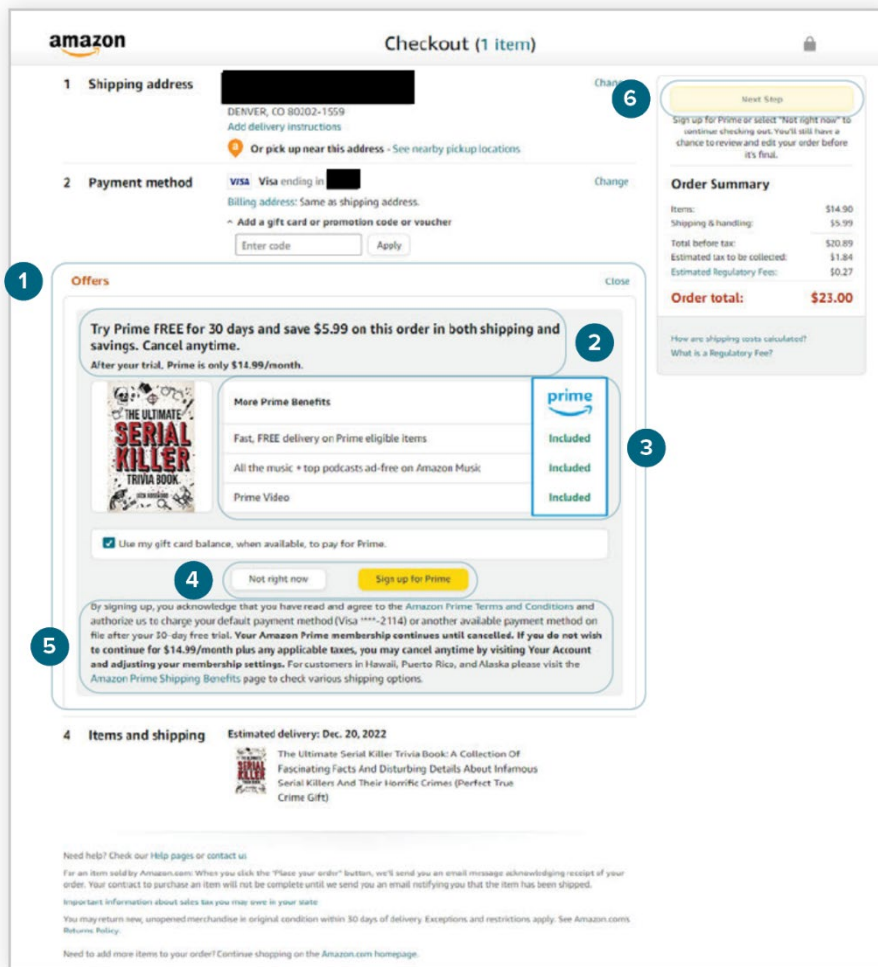


Figure 14: TSPC "Offers" Section on Desktop

166. The FTC asked me to assume that the image below reflects a representative image of the TSPC’s Review Items and Shipping section on desktop.

**amazon** Checkout (1 item)

**1 Shipping address** Change  
 DENVER, CO 80202-1559  
 Add delivery instructions  
 Or pick up near this address - See nearby pickup locations

**2 Payment method** Change  
 visa Visa ending in [REDACTED]  
 Billing address: Same as shipping address.  
 Add a gift card or promotion code or voucher  
 Enter code Apply

**3 Offers** Change

**4 Review items and shipping**

**FREE TRIAL**  
 [REDACTED] we're giving you Prime FREE for 30 days!  
 Get your Prime eligible items Tuesday, Dec. 20 by 11PM Monday, Dec. 19 by 11PM for \$5.99 FREE  
 Get FREE Prime Delivery with Prime. No hassle. No commitments. Cancel anytime.

**Estimated delivery: Dec. 20, 2022**  
 Items shipped from Amazon.com

**The Ultimate Serial Killer Trivia Book:**  
 A Collection Of Fascinating Facts And Disturbing Details About Infamous Serial Killers And Their Horrific Crimes (Perfect True Crime Gift)  
 by Rosenwald, Jack  
 \$14.90 & FREE Returns  
 Qty: 1  
 Sold by: Amazon.com Services LLC  
 Amazon Prime eligible. Join now  
 Add gift options

**Choose a delivery option:**  
☐ Monday, Dec. 19  
 FREE Prime Delivery with your free trial of Prime  
☒ Tuesday, Dec. 20  
 \$5.99 - Shipping  
☐ Monday, Dec. 19  
 \$9.99 - Shipping

**Order total: \$23.00**  
 By placing your order, you agree to Amazon's privacy notice and conditions of use.

**Place your order**

Need help? Check our Help pages or contact us.  
 For an item sold by Amazon.com: When you click the "Place your order" button, we'll send you an email message acknowledging receipt of your order. Your contract to purchase an item will not be complete until we send you an email notifying you that the item has been shipped.  
 Important information about sales tax you may owe in your state.  
 You may return new, unopened merchandise in original condition within 30 days of delivery. Exceptions and restrictions apply. See Amazon.com's Returns Policy.  
 Need to add more items to your order? Continue shopping on the Amazon.com homepage.

Figure 15: TSPC "Review items and shipping" Section on Desktop

167. The TSPC page still exhibits many of the issues in the SPC page from the MPP flow. For instance, the product page in the TSPC checkout flow still does not give information on the costs or recurring payments required for Amazon Prime or on any of the subsequent pages in the flow prior to the offers being shown in **Attachment E**. Even when the amount that Amazon Prime will cost (\$14.99/month) is shown, it is still not disclosed in an adequate manner for a user to be fully informed about the cost or recurring payments after a free trial ends. Also, Amazon Prime is again presented as being associated with fast, free shipping rather than being a subscription package with other benefits which may confuse a user purchasing a product who will be likely be looking for shipping options for their product purchase.
168. The "offers" panel also still exhibits many of the dark patterns that I observed in the other pages with Prime detours. **Attachment E**. For instance, the "offers" section is a Forced Action, as the user has to select either the enroll or decline options in the Offers section before they can place their order. Like the



SPC page, this flow conflates two distinct tasks: buying a product on Amazon (which is the primary goal) and enrolling in Prime, which may confuse users who are operating under System 1 thinking. If the user is paying attention to their purchase, they likely miss the disclosures about the cost and recurring payments associated with a Prime subscription. Importantly, the “Offers” section only puts the price of Prime in small print below the enrollment button and in small print toward the top of the panel, directly below a much more prominent headline “FREE” Prime. Another example of the conflation of the two tasks is in the TSPC page, in which the “Offers” for Prime are embedded in a page that is otherwise all related to purchasing a product, which again is unrelated to a user’s primary goal. **Attachment E.**

169. The TSPC also uses dark patterns, such as Confirmshaming and Nagging with the decline option having the words “Not right now”. “Not right now” implies that the consumer can only say no temporarily, not permanently. This button is still not weighted the same as the “sign up for Prime” button. Users more likely to click on brighter yellow button on the right since all the screens prior to this one required a click on a yellow button to advance to the next part of the purchase process.
170. One improvement in TSPC is that the button to enroll in Amazon Prime now has the words “sign up for Prime” which makes it a little bit clearer that by clicking on this button, the user will be signing up for something called Prime even if the user does not specifically understand the terms of the sign up (costs or the recurring payments once the free trial ends). Another improvement is that the Amazon Prime offer is being made under an explicit “Offers” subpage which may help users to understand that the information they are reading here may or may not be related to the product purchase they are making. This is an improvement over the UPDP page.
171. The TSPC still has inadequate disclosures about the cost and renewal terms of Amazon Prime – these terms are placed in smaller font below the big “Try Prime FREE for 30 days and save \$5.99 on this order in both shipping and savings. Cancel anytime” headline and therefore this information “After your trial, Prime is \$14.99/month” is likely to be ignored by the user even with the bold font since it is smaller text and harder to read. This is the same for the terms and conditions in the offer banners – although the cost of Prime and the renewal terms are listed and in bold, a user is likely to ignore this information since they do not typically read terms and conditions. Prime also still framed very positively as being associated with free shipping and the negative sides such as costs and monthly charges are downplayed in the presentation of information.
172. In the “Review items and shipping” there are similar dark patterns and problems to SPC in the MPP flow. In True SPC the “Review items and shipping” subpage is actually less clear than the SPC banners in MPP since

there is less information about cost/renewal terms for Amazon Prime in the new banner. **Attachment E.** It is also unclear what clicking “Get FREE Prime Delivery with Prime” does. The shipping option that enrolls a user in Amazon Prime is also not clear, much like MPP SPC, since it has the words “Free Prime Delivery with your free trial of Prime,” so if a user clicks this, they will not know the cost or monthly charges associated with Amazon Prime at this stage (unless they reviewed that information in the “Offers” panel and recognized that it also applied in the “Review items and shipping” panel).

173. The TSPC modal offer has similar issues to MPP—again, the button to “Sign up for Prime” is colored yellow which is usually the option a user should select to advance to the next screen. **Attachment P.** The decline button also invites Nagging because it says “Not right now” which means a user will be asked again if they want to join Amazon Prime even if they decline on this popover. Also, again, the price information is shown in the smallest font on the page under the “Try Prime FREE for 30 days and save \$5.99 on this order in both shipping and savings. Cancel anytime” and again under the buttons to decline or enroll in Prime in terms and conditions fine print that a user is not likely to read. The interface also has a Bad Default in that the option “Use my gift card balance, when available, to pay for Prime” checked, meaning that even if the user’s credit card is not charged their gift card balance if it exists will go towards a Prime subscription. This is also easily missed on this popover.
174. Similar to MPP, once a user clicks to enroll in Amazon Prime using the SPC banner in the “Review items and shipping” section, the new informational banner does not make clear the cost or renewal terms due to Interface Interference manipulative designs—that is, the information is presented again in a small bold font, while other words are presented in a more eye catching manner a in blue and green font. **Attachment E.**
175. The TSPC also makes it harder to remove an Amazon Prime subscription than MPP. **Attachment E (page 8).** A user has to use a dropdown to change “Qty” from “1” to “0” on the item “Amazon Prime (30-day Free Trial). This is hard for a user to understand because they must first recognize that a subscription has been added to their cart and then also realize that they must change quantities to remove it. It is also not clear since a user is not likely to ever have multiple Prime subscriptions in the cart, again meaning it requires a lot of mental effort to understand that the item can only be removed by changing the quantity to 0. In some ways, this makes it consistent with how a product is removed from the cart by making the “Qty” 0. However, since an Amazon Prime subscription is fundamentally different from a product, this is likely to confuse a user.
176. Much like in MPP, the terms and conditions which show the cost and recurring charges for Prime are displayed in the terms and conditions under the “Place your order” button (and only if the consumer has clicked an option to try



Prime), but they are likely to be missed by the user since this is in a smaller font that users typically ignore. **Attachment E.**

177. In TSPC, the confirmation message is improved in that it says “Amazon Prime (30-day trial) is applied to your account” with the Prime logo, but this still does not make it clear that there will be recurring charges following the trial. Similarly in TSPC, users may not realize that accepting the offer or clicking on the offer in “Offers” or in the “Items and Shipping” boxes are going to enroll them in a subscription since the feedback on this separate task is all interlaced with information about purchasing a product. TSPC movement of “Offers” into a separate box does more clearly delineate that this is a separate task unrelated to the primary task but the Offers page still does not use font sizes and text sizes for the cost and renewal terms that are clear and conspicuous to the user, much like MPP. **Attachment E (page 6).**
178. Finally, there is an improvement in the confirmation message after the order is placed on TSPC. **Attachment E (page 9).** The TrueSPC adds on screen information that a free trial for Amazon Prime is added in addition to the product being ordered, which is better than MPP which did not include this information. However, the confirmation message still does not make it clear on this page that the user will be charged after the trial is over or offer them to cancel from this page, which would allow them to undo the action if they made a mistake and only realized it once they had placed their order.

**f) The Prime Enrollment Detours in the Online Checkout Process on Desktop and Mobile Devices Confuse Consumers and Do Not Clearly Convey Prime’s Material Terms.**

179. The cognitive walkthrough of the Prime enrollment detours in the online product checkout flows led me to the following conclusions: (1) the design of the enrollment interfaces does not make it clear to consumers that they are enrolling in Prime because consumers’ primary task in going through the checkout process is to make a purchase on Amazon, (2) the design of the checkout process does not give adequate information or feedback about Prime at decision points, (3) the design of the checkout process does not convey sufficient information about cost and charges to consumers in a clear manner, (4) the design of the checkout process contains multiple techniques to hinder a user from understanding all of their options, (5) the design of the checkout process is even more problematic on mobile devices, and (6) the dark patterns I identified have a cumulative effect on consumers, which detracts from their ability to understand the disclosures or provide informed consent.
180. First, consumers may not know that they are enrolling in Prime because the Prime enrollment detours in the product checkout process conflate the two tasks of purchasing a product and enrolling in Prime. As the cognitive walkthrough shows, the Prime detours on desktop and mobile are confusing

because a user's primary task is to purchase a product, not to enroll in a Prime subscription.

181. When navigating a system to achieve their goal, a user is primarily focused on actions to achieve that goal and continuously assesses whether their actions on the interface are getting them closer to their goal [39,60]. A user is likely not paying close attention to information that is not related to their goal [60]. In fact, when purchasing a product and multi-tasking, a user is likely relying on System 1 thinking [39,92] to make quick decisions based on heuristics instead of using System 2 thinking and carefully processing all information at each step of the checkout process, so that they can quickly and efficiently buy the product they set out to purchase.
182. Here, a consumer's primary goal in using Amazon's online checkout is to make a purchase and place an order. Enrolling in Prime is not the primary goal of such a user. By placing these two tasks—placing an online order and enrolling in Prime—in the same process, Amazon's interface is confusing to users as they will not be fully aware that they are also completing a secondary task of enrolling in a subscription.
183. Because users are not necessarily expecting to enroll in a subscription in the checkout process, they are likely not paying close attention to any information that is not related to their purchase, such as enrolling in Prime. Instead, consumers going through the checkout flow are likely paying close attention to the information about the product cost, shipping the product, and completing their product purchase.
184. Second, the design of the checkout process does not give adequate information or feedback about Prime at decision points in the checkout process. From a design heuristics perspective, the checkout interface contains insufficient prominent and conspicuous feedback—that is, visual or audio cues—to indicate to a consumer what action has been taken and what has occurred as a result [60], likely to confuse them. Consequently, consumers may not realize they have enrolled in Prime after selecting the Prime detour options UPDP, SOSP PDP, SPC, and TSPC since this information is not related to their primary task of purchasing a product and this information is not always clear and conspicuous, due to the use of fine print or items that appear to also be products in a cart. For instance, the buttons to enroll or decline to enroll in Prime in the UPDP or the SOSP PDP pages often do not even contain wording to indicate that they pertain to a Prime subscription enrollment rather than the shipping of a product the user is trying to purchase. Moreover, throughout the entire product checkout process, the SPC page (in the MPP flow) is the only point at which Amazon tells a user they have enrolled in Prime. **Attachment G.** Even then, the wording of the disclosures is primarily related to the product purchase and emphasizes fast, free shipping. As such, a user may not notice that this has enrolled them in

the subscription.

185. Another example is the wording in the TSPC. On that page, a user who has selected Prime is shown: “A 30-day FREE trial of Amazon Prime has been added to your order. Your order has been upgraded to fast, FREE shipping.” **Attachment E**. However, the text “After your free trial, Prime is just \$14.99 a month” is much less prominent. While this wording is better than on the SPC, a user is still likely to miss it because they are not expecting a subscription to be added to their cart and instead may be focused on the product they are purchasing and the related details, such as the shipping speed and quantity. Also, adding Prime to the cart as an item is confusing since a user may not think of a subscription in the same way as the product they are purchasing, and its value is \$0.00, suggesting it is free which, again, may not be adequate to disclose the recurring charges
186. Third, the design of the checkout process does not present sufficient information about the cost or the renewal terms of Prime in areas of the product checkout flow pages where a user is likely to look. The cost of a Prime subscription is typically presented at the bottom of the UPDP or SOSP PDP pages in the terms and conditions section which users rarely read [3,37,41,63,88] or on the SPC page in small terms and conditions below the “Place your order” button, if at all. *See Attachment G*. These disclosures are generally in a small font. In fact, the disclosures are typically in the smallest font on the page which means the user is less likely to notice them as compared to any other information on the screen with a larger font size. Similarly, on the TSPC, Amazon only discloses the cost of a Prime subscription in a small font in the “Offers” and the checkout view. *See Attachments E, H*. None of the pages relate to the product or the collection of a user’s shipping or payment information, nor do they contain any information about the cost or renewal terms for Prime after the 30-day free trial period. Thus, if a user misses the information at the points mentioned above, they may not know the cost, renewal terms of Prime either at the point at which they are at a decision-making point.
187. Fourth, the design of the checkout process makes it difficult for consumers to enroll in Prime with informed consent, as the checkout process is rife with Prime detours that are emphasized through manipulative techniques, or dark patterns, to steer them into enrolling in Prime, even if they do not understand the terms of the subscription. These interfaces do not adhere to fundamental principles of good design, such as providing feedback to users about the consequence of each action they take on the interface, and therefore impair consumers’ ability to make informed decisions. The dark patterns used in the checkout process—Social Engineering, Forced Action, Interface Interference, Obstruction, and Sneaking—capitalize on the way people are likely to act or behave when using System 1 quick thinking.

188. The checkout process also uses Forced Action, so that a consumer is forced to decide to enroll or decline Prime on the UPDP or the SOSP PDP before placing their order and completing their purchase. There is no other way to complete the transaction even if a consumer did not want to enroll in Prime in the first place. Again, this means that a user has to take an action that is likely not be related to their primary goal of purchasing a product and, therefore, that consumer is likely paying less attention to UPDP or SOSP PDP pages. The MPP also uses Nagging in that consumers are presented with several Prime detours within a single checkout flow, i.e., on the SOSP PDP, UPDP, SPC, and TSPC, even if they have already previously declined to enroll in Prime.
189. Additionally, the FTC asked me to assume that if a consumer declines to enroll in Prime during the checkout process, the same Prime detours are displayed *again* when they enter the checkout process to place a new online order. This is also a form of nagging a user across shopping sessions. Nagging is a manipulative technique to wear down consumers so they are more likely to give into enrolling in Prime, rather than intentionally making an informed choice to enroll.
190. The design of the pages within the checkout process themselves also interferes with consumers' ability to understand what a Prime subscription entails. The use of Manipulating Choice Architecture dark patterns makes it easier for a consumer to enroll in Prime than to decline the subscription. The Prime detours use Emotional and Sensory Manipulation by positively framing Prime with the word "free" which is sometimes in capital letters and bolded and is repeated constantly throughout the process. The enroll button is also visually emphasized through its bright yellow or orange color and its position on the right, often in contrast with the muted decline option on the left. The enroll button is also visually presented the same way as other buttons in the checkout process that allow consumers to move along in the process, such as the "Add to Cart," "Proceed to Checkout," and "Place your Order" buttons. This positive framing can distract a consumer from noticing that Prime's cost, renewal terms, or even that Prime is a subscription.
191. The checkout flow uses language that shames consumers into selecting the enroll button. The language in the decline button option connotes a sense of loss ("No thanks, I do not want FREE delivery") while the enroll button ("Get FREE-same day delivery") connotes a sense of gain. **Attachment C** (page 10). This use of Confirmshaming can undermine a user's agency and make them more likely to select the enroll button because it may make them feel as though they are losing money on delivery.
192. Moreover, the information about Prime's cost and renewal terms is often tucked away in the terms and conditions sections so that the consumer is likely to not see them due to their smaller font and placement on the page.

This dark pattern is known as Sneaking.

193. The checkout flow also uses Obstruction, as it is easier to enroll in Prime on UPDP and SOSP PDP than to remove the subscription on the SPC or TSPC. To remove Prime before placing their order (and enrolling in Prime), a consumer needs to recognize that Prime is in their shopping cart and know how to remove it before they click the “Place your order” button. The “remove” option is often hard to find on the page and hidden.
194. Fifth, the Prime disclosures in the checkout process on a mobile device are less noticeable than they are on a desktop. Notably, the issues consumers encounter with Prime detours in the checkout process are more prominent on a mobile device because of the need to scroll down each page to see any disclosures and the use of sticky footers. Users are generally more likely to pay more attention to information at the top of a page on any device and avoid scrolling [64,106,107]. Users are also more likely to pay more attention to the first pages in a flow than the last ones [64,106,107]. Mobile devices exacerbate these issues because the information on the mobile device is presented vertically rather than horizontally, so the options are stacked one on top another. The vertical layout on a mobile device and the smaller size of mobile screens also mean that consumers may need to scroll more to see the options available to them and may not be able to read the information as easily. In fact, not all consumers going through the checkout process on mobile devices know that they have to scroll. They may therefore not see all the options available to them [26]. Users can get lost in long web pages on a mobile device and find it difficult to find information [82]. Users may experience an “illusion of completeness” on a mobile device and may assume they have all the information they need in the viewable area of the device, even though important information they need may be *outside* the viewable area of the device [107]. Additionally, people using a mobile device are more likely to be multi-tasking, and their attention is even more divided than on a desktop device [97]. If they are preoccupied with multiple tasks, they are likely more reliant on their System 1 thinking to make decisions without fully comprehending the information displayed to them [39,92].
195. In fact, dark patterns are notably more effective on a mobile screen where users have to scroll and be subject to animations and user interface dialog boxes which interrupt a user's flow through a task, and hyperlinks that can take a user away from their desired goal to name a few. Research suggests that reading on a screen can create a higher cognitive burden on users and may be less effective on paper [18,35].
196. Sixth, the presence of multiple dark patterns throughout the checkout process are likely to have a cumulative effect on consumers. The presence of multiple dark patterns act in tandem to influence the user. The more aggressively a user is exposed to multiple dark patterns, the more likely it is for them to give

into them [50,100]. Given that there are so many dark patterns in the checkout process for the Prime detours, it will also place more of a cognitive burden on consumers [60] and require them to expend more mental effort to consciously find the information on the cost and recurring nature of Prime and intentionally enroll in Prime, given the subscription is not related to their primary goal of purchasing a product.

197. The hard offer Prime detours are even more confusing than the free trial ones. The hard offer Prime detours enroll users into Amazon Prime and charge them a monthly fee straight away when they place a product order, or, in the case of UPDP, even *before* they place the product order. *See supra*, Section VI(a). Consumers who unintentionally enroll in Prime through a hard offer do not have a window period (such as the free trial one) to cancel their Prime subscription and avoid incurring financial losses. **Attachment C.**

## **VII. The Cognitive Walkthrough of the Iliad and Iliad 2.0 Shows that the Online Cancellation Process Is Difficult to Find, Has Too Many Steps, and Uses Manipulative Designs to Prevent Consumers from Cancelling Prime.**

198. As described below, the information contained in this section regarding how the online Prime cancellation process works was provided to me by the FTC. I also generally confirmed that information by reviewing videos of the Prime product checkout and static images that I understand to have been produced by Amazon or captured by the FTC from the Amazon website.
199. In this section, I discuss the two Prime online cancellation processes—the Iliad and Iliad 2.0—based on information that the FTC provided me. I then explain the big picture design issues in these processes that I found during my cognitive walkthrough before providing an in-depth analysis of each page’s design.
200. The FTC asked me to assume that Amazon named its cancellation process “Iliad.” I recognize *Iliad* as the title of the ancient Greek epic poem by Homer that is known for being a long and difficult-to-read text.

### **a) Overview and Cognitive Walkthrough of the Iliad Cancellation.**

201. The FTC asked me to assume that the first online cancellation process, is known as the “Iliad.”



202. The FTC asked me to assume that the flowchart below shows the Iliad process from Prime Central on a desktop device.

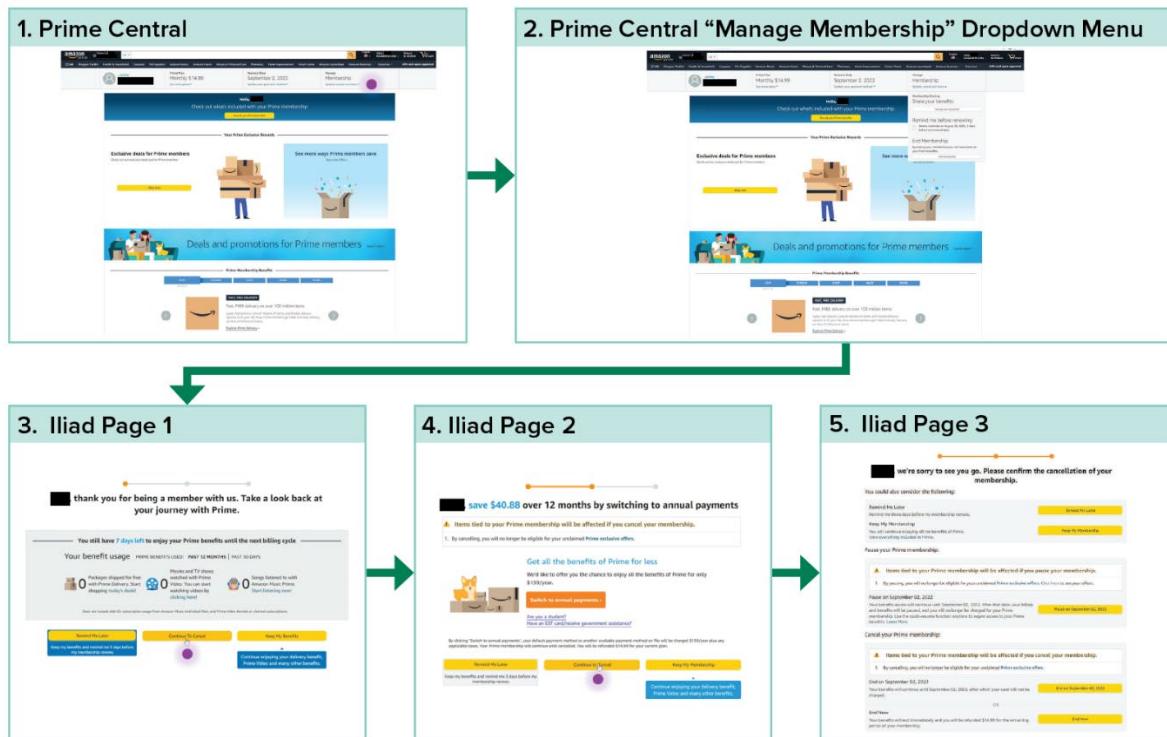


Figure 16: Iliad Cancellation

203. The FTC asked me to assume that the flowchart below shows the Iliad process from the Amazon homepage on a mobile device.



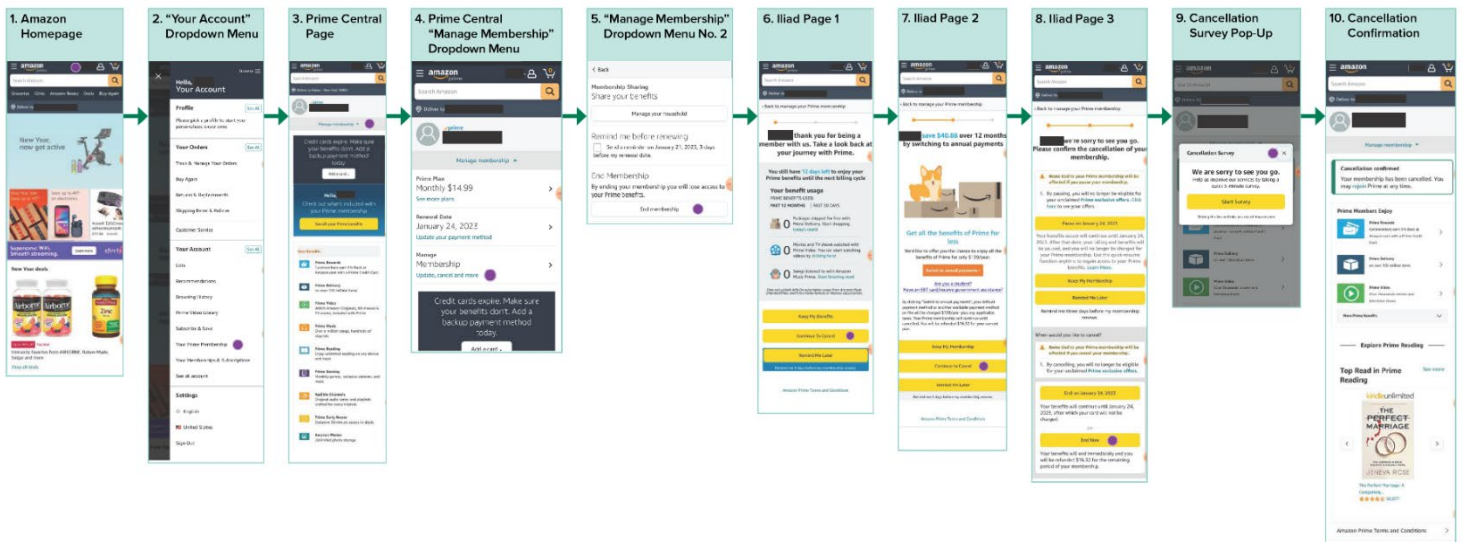


Figure 17: Iliad Cancellation Menu Mobile

### i. Finding Iliad

204. The FTC asked me to assume that consumers can find Iliad on desktop in a few different ways.

205. One of the ways to access Iliad is from the [www.Amazon.com](http://www.Amazon.com) website by navigating to the Prime Central page (also known as the “/Prime” page, which is essentially the landing page for the Prime membership.)

206. Consumers can access the cancellation process through Prime Central by taking the following steps, beginning from the [www.Amazon.com](http://www.Amazon.com) home page:

- (i) Select “Accounts & Lists” to get a dropdown menu
- (ii) Click on “Prime Membership”
- (iii) Click on “Manage Membership”
- (iv) Click on “End Membership”

207. Consumers can also search for Iliad on [Amazon.com](http://Amazon.com) by typing “cancel membership” in the search bar, which produced an “Alexa” answer with a “End Your Amazon Prime Membership” link. **See Attachment M** Clicking the link takes the consumer to another page that states “End Your Amazon Prime Membership” and contains another “End Your Prime Membership” button. **See Attachment M**. Clicking that button does not end the consumer’s Prime membership; it takes them to the next page in the Iliad

process.

208. The steps to reach the cancellation process on a mobile device are similar to the ones on desktop, though lengthier in clicks/taps and more complicated in terms of needing to scroll down the page to proceed. Consumers can access the cancellation process through Prime Central by taking the following steps:

- (i) Tap on “My Account” on the Amazon website to generate a dropdown menu
- (ii) Scroll down and select “Manage Prime Membership” from the dropdown menu
- (iii) Select “Manage Membership”
- (iv) Select “Manage Membership” (again)
- (v) Select “End Membership”

209. The FTC asked me to assume that typing “cancel membership” in the search bar on a mobile device yields a similar pathway to the cancellation process as on a desktop.

210. The process of finding Iliad violates HCI good design principles and contains dark patterns.

211. First, the entry point into the cancellation flow from the Prime Central page is visually not simple to locate on the screen because it is not clearly labeled and Amazon uses Obstruction dark patterns. The only location where the word “cancel” appears is in the smallest font on the page, underneath “Manage Membership”—and even then, the word “cancel” is sandwiched between “update” and “and more.” Additionally, it is unclear what “cancel” refers to. It is reasonable for users to believe that “cancel” could refer to cancelling an Amazon order or any of the other membership that Amazon offers, such as Amazon Video or Amazon Music. Furthermore, most of the visual space on this Prime Central page is focused on Prime benefits, such as “Check out what’s included in your Prime membership” and “[e]xclusive deals for Prime members.” In fact, the only two yellow buttons displayed on the page—which users are likely to look for given the yellow button typically moves users along on the Amazon website (*see supra*, at Section VI)—are “See all your Prime benefits” and “Shop now.”

212. Second, the wording of the links and dropdown menu that a consumer has to click to reach Iliad or Iliad 2.0 are confusing, which makes the cancellation process not simple to find. For instance, all users may not intuitively know that they need to click on “Manage membership” to access the dropdown menu and move forward in the cancellation process—even adding “Update, cancel and more” is not clear for the reasons discussed above. If users are

looking to cancel their subscription—using System 1 quick thinking—or do not understand they have enrolled in Prime, they may not easily find the right entry point to proceed with cancelling Prime. “End Membership” or “Cancel Membership” are clearer options for users. Moreover, the words associated with the “End Membership” option, which are “By ending your membership, you will lose access to your Prime benefits,” emphasizes the loss that a user might experience if they choose to move forward with that option, thus discouraging the user from proceeding. This is an Interface Interference dark pattern.

213. Third, Amazon has included additional, unnecessary steps for a consumer to reach the Iliad or Iliad 2.0. For instance, after selecting “Manage membership” in a hidden dropdown menu, a consumer has to sift through multiple options, such as “Share your benefits” and “Remind me before renewing,” before reaching “End Membership,” which is placed at the bottom of the vertical list. This design choice is known as “creating barriers” and “adding steps,” both of which are dark patterns where the service provider—Amazon—includes unnecessary steps to prevent people from easily achieving their goal (such as cancelling Prime) which is detrimental to the service provider, Amazon.
214. The cancellation process is especially difficult for people who did not intend to enroll in Amazon Prime.
215. Finding the entry point to Iliad from the Prime Central page on a mobile device is even harder on a mobile device than on a desktop since it requires consumers to navigate from “Your Account” to “Your Prime Membership” to “Manage Membership” through dropdown (or hamburger) menus before getting to the cancel option. Having more steps on a smaller screen means that a consumer needs to scroll to locate the entry point and is more likely to abandon cancellation simply because they could not find the entry point into the cancellation process.

## ii. Iliad’s Marketing Page

216. The FTC asked me to assume that, once consumers locate Iliad, they are directed to the Marketing Page. **Attachment L.** The Marketing Page focuses on the consumer’s benefit usage, asking consumers to “[t]ake a look back at [their] journey with Prime”. It summarizes the number of days the consumer has before their Prime membership ends and presents a summary showing the Prime services they used. Amazon also displays marketing material on Prime services, such as Prime Delivery, Prime Video, and Amazon Music Prime. Amazon places a link for each service and encouraged consumers to access them immediately, such as by stating “Start shopping today’s deals!”, “You can start watching videos by clicking here!”, and “Start listening now!” Clicking on any of these options takes the consumer out of the Iliad, meaning

that Amazon continues to bill the consumer for Amazon Prime unless they restart and complete the Iliad.

217. At the bottom of the Marketing Page, Amazon presented consumers with three buttons. The “Remind Me Later” button on appeared on the left, below which Amazon mentioned in small print a reminder will be sent three days before the membership renewal. The “Remind Me Later” button took the consumer out of the Iliad Flow without cancelling Prime. “Keep My Benefits,” on the right, also took the consumer out of the Iliad Flow without cancelling Prime. Finally, “Continue to Cancel,” in the middle, also did not cancel Prime but instead proceeded to the second page of the Iliad Flow.
218. The below image is a screenshot of Iliad’s Marketing Page on desktop.

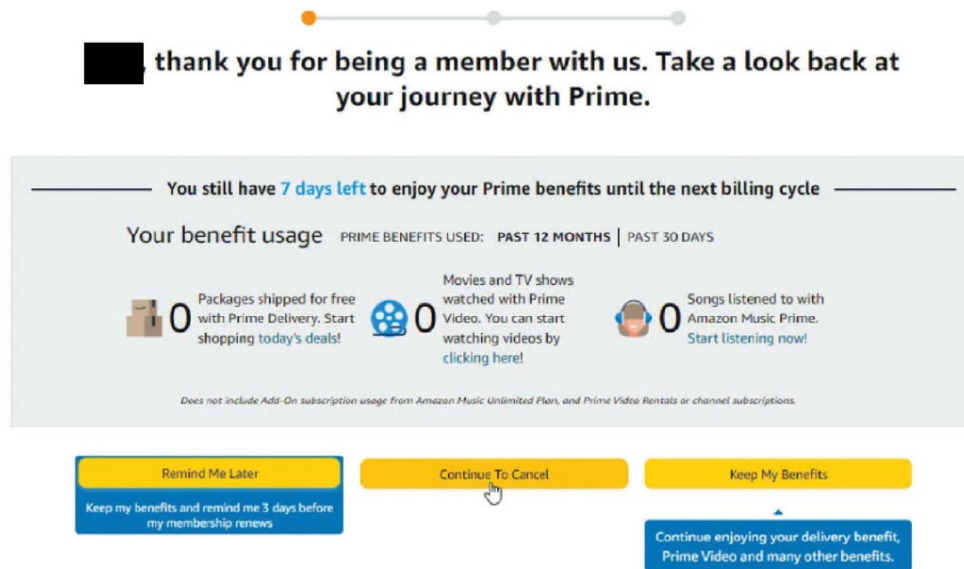


Figure 18: Iliad Marketing Page

219. The above image (Figure 17) is a screenshot of Iliad’s Marketing Page on mobile.
220. Amazon uses design techniques on this Marketing Page to make it harder than necessary for a user to click on the “Continue to Cancel” button and to distract users from proceeding with their cancellation.
221. First, the Marketing page floods users with information that is nearly exclusively focused on their Prime benefits, including user’s “benefit usage,” the number of “[p]ackages shipped for free with Prime Delivery” the user has had, the number of “[m]ovies and TV shows watched with Prime Video,”

and the number of “[s]ongs listened to with Amazon Music Prime.” None of this information is related to cancelling Prime and creates cognitive overload on the consumer, who needs to expend additional mental effort to process additional information to figure out whether these benefits pertain to their goal of cancelling Prime and may become distracted by them. Should the user want to get more information or clarity on the benefits to which Amazon refers and clicks on any of the benefits links, Amazon removes the user from the cancellation process. Furthermore, the only location on this first page that has any connection to cancelling a Prime membership is the yellow button in the middle of the page labelled “Continue to Cancel.” The “Continue to Cancel” button is also the only button that, if clicked, would not remove the user from the cancellation flow but rather advance them further in the cancellation process.

222. On at least one version of Iliad on mobile, the focus on benefits is even more pronounced. The header asks the consumer if they “still want to end [their] Prime benefits” instead of their Prime membership. The option to remain in Prime is also framed as “Keep my benefits” and the option to cancel Prime as “Cancel my benefits.” Consumers looking to end their Prime subscription may be confused by the use of “benefits” to refer to Prime. **Attachment R.**
223. Second, the Marketing page uses choice overload to lead users to abandon cancellation. There are two options to abandon the cancellation flow and stay enrolled and only one option to proceed to cancel. It is well known that users want to keep the status quo when presented with a change due to cognitive and behavioral biases [92]. Users are resistant to change and if they are enrolled in Prime and likely to remain enrolled to preserve the status quo, so having two options to keep enrolled in Prime versus one to cancel also plays to this bias and means users are more likely to choose an option to stay enrolled in Prime.
224. Third, Amazon manipulates the choice architecture available to users by ordering the three yellow buttons at the bottom of the page, from left to right, “Remind Me Later,” “Continue to Cancel,” and “Keep My Benefits.” Users instinctively tend to select options that appear on the far right because that is typically the location of the button that moves the user further along the process they are trying to complete. *See supra*, Section VI. Amazon even socializes its users to click on buttons located on the right in the online checkout process, where the button on the right gets the user closer to placing an order on Amazon. *See supra*, ¶ 124. Users are therefore required to carefully read their options to proceed with cancellation.
225. Fourth, the design of this page does not present users with logical symmetric choices, or clear binary options, to cancel their Prime subscription or abandon cancellation. This creates a cognitive burden, requiring the user to expend additional mental effort to figure out how to interpret the information

they are seeing and decide how to act, which can hamper decision-making [23,60,78], on a user to determine which of the buttons presented actually allows them to proceed through cancellation as they intended. This is also a Bait and Switch type of Sneaking since a consumer may be trying to cancel and may end up selecting an option that keeps them enrolled instead, such as “Remind Me Later.”

226. Fifth, both the “Remind Me Later” and the “Keep My Benefits” use unclear language. Users may not know what action the “Remind me later” button leads to, based on the language alone. For example, that button could suggest that the user would receive a cancellation reminder or a reminder to re-join Prime. The additional information in the blue box surrounding the “Remind Me Later” button does not add any clarity beyond the *timing* of the reminder: “Keep my benefits and remind me 3 days before my membership renews.” Nor does the text on the page clarify of what Amazon will remind the consumer—for example, consumers who believe they have completed cancellation may understand the reminder button is tied to Amazon’s prominent headline on the page inviting them to “Take a look back at your journey with Prime.” Similarly, “Keep My Benefits” is not clear either, as there is no reference to a membership in the language of the button itself or in the blue box below (“Continue enjoying your delivery benefit, Prime Video and many other benefits”).
227. Sixth, Amazon uses Visual Prominence by applying highlights to direct the user to specific options that do not lead to cancelling Prime. For example, both the “Remind Me Later” and the “Keep My Benefits” buttons have an eye-catching blue frame underneath them that draws the user’s attention, but the “Continue to Cancel” option does not.
228. Seventh, Amazon uses confirmshaming language to dissuade Amazon from cancelling Prime. For instance, “Keep My Benefits,” as opposed to “Keep My Membership,” reminds the user that they may lose benefits by cancelling Prime. The “[Redacted], thank you for being a member with us. Take a look back at your journey with Prime” is also another attempt to convince the user to not cancel their Prime subscription, as it elicits feelings of regret. This language in particular can also make a user believe that they are done with the cancellation process and simply revisiting the benefits they used while they were a Prime subscriber.
229. Similarly, a lot more scrolling is also required on the mobile experience to find the right option to cancel. **Attachment S.** The issues are more problematic on a mobile device. Users must consciously think about which option will advance them to continue to cancel since the mobile option to cancel is the middle button on the screen (“Keep my benefits”, “Continue to Cancel”, and “Remind me later”). Also, the remind me later button has a blue highlight which could draw a consumer’s attention.



iii. **Iliad's Offers Page**

230. The FTC asked me to assume that consumers land on the Offers Page if they select "Continue to Cancel" on the Marketing Page. **Attachment L.** On the Offers page, Amazon presents consumers with alternative or discounted pricing, such as the option to switch from monthly to annual payments (and vice-versa), student discounts, and discounts for individuals with EBT cards or who receive government assistance. Amazon emphasized the option to switch from monthly to annual payments by stating the amount a consumer would save at the top of this page in bold. Clicking the orange button ("Switch to annual payments") or the links beneath took the consumer out of the Iliad without cancelling.
231. Right above these alternatives, Amazon states "Items tied to your Prime membership will be affected if you cancel your membership," positioned next to a warning icon. Amazon also warns consumers that "[b]y cancelling, you will no longer be eligible for your unclaimed Prime exclusive offers," and hyperlinked to the Prime exclusive offers. Clicking this link took the consumer out of the Iliad without cancelling.
232. Finally, at the bottom of the Offers page, Amazon presents consumers with buttons offering the same three options as the first page: "Remind Me Later," "Continue to Cancel," and "Keep My Membership" (labelled "Keep My Benefits" on the first page). Once again, consumers could not cancel their Prime subscription on this page of the Iliad. Choosing either "Remind Me Later" or "Keep My Membership" took the consumer out of the Iliad without cancelling. Consumers had to click "Continue to Cancel" to access the next page of the Iliad.
233. The below image is a screenshot of the Offers page of the Iliad.



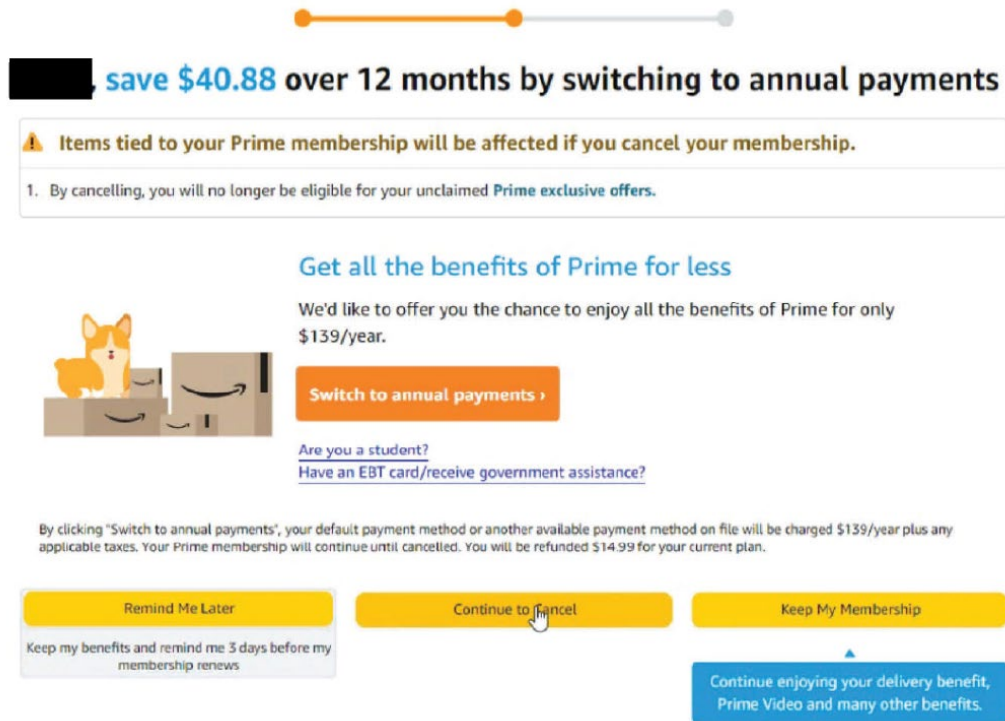


Figure 19: Iliad Offers Page

234. Amazon uses design techniques similar to the Marketing Page to make it harder than necessary for a user to click on the “Continue to Cancel” button and to distract users from proceeding with their cancellation.
235. The Offers Page—like the Marketing page—presents users with information that is nearly exclusively focused on alternative Prime payment plans, such as “annual payment,” a “student” plan, and a plan for those with “an EBT card” or who “receive government assistance.” None of this information is related to cancelling Prime and creates cognitive overload on the user. Furthermore, the only location on this page that has any connection to cancelling a Prime subscription is the yellow button in the middle of the page labelled “Continue to Cancel.” The “Continue to Cancel” button is also the only button that, if clicked, would not remove the user from the cancellation process but rather advance them further in it.
236. The Offers Page also uses choice overload by presenting users with two options to remain an Amazon Prime subscriber and one to cancel Prime, choice architecture manipulation by using the same confusing order for the three yellow buttons, asymmetrical choices by presenting non-binary options, visual prominence with respect to the buttons, and unclear language for the “Remind Me Later” button. Also, a consumer is forced to go through another

set of options that repeats the process they already followed on the Marketing page, which adds an unnecessary Obstruction step and is a Forced Action. This could make more consumers abandon the cancellation process.

237. This Offers Page also uses Interface Interference such as positive and negative framing of options and wording to make users feel a sense of loss. The negative framing emphasizes loss when a user is trying to cancel a Prime subscription because most users are loss averse, that is they want to try to avoid having losses where they can. By inducing loss aversion, this screen's wording manipulates the user to stop on this page in the cancellation process, Framing effects highlight and induce feelings of gain with wording such as e.g., "Redacted, save \$40.88 over 12 months by switching to annual payments" and loss via warning icons with ominous text such as "Items tied to your Prime membership will be affected if you cancel your membership" and "By cancelling, you will no longer be eligible for your unclaimed Prime benefits".
238. In addition to using the same designs as in the Marketing Page, the Offers Page presents new-to-the-user manipulative designs to make the cancellation more difficult than necessary. First, the wording of the button that, if selected, would preserve a user's Prime subscription is different on the Offers Page ("Keep My Membership") than on the Marketing Page ("Keep My Benefits"). The pattern disruption in this language, though improved on the Offers Page, can confuse the user, who needs to process new information on the second page. This also occurs on the Offers Page, where "Cancel my Benefits" on the Marketing Page becomes "Keep my Membership" and "Cancel my Benefits" becomes "Continue to Cancel."
239. Second, the use of the warning icon with the text "[i]tems tied to your Prime membership will be affected if you cancel your membership" suggests to users that they are on the verge of experiencing a loss that can trigger loss aversion. This is also an instance of Emotional or Sensory Manipulation (Interface Interference.) Here the user is being urged to switch to annual payments to save money or to switch to a student subscription if eligible to "Get all the benefits of Prime for less."
240. By the time the consumer reaches the Offers Page, the cancellation process has exposed them to multiple dark patterns, including Nagging by asking them if they would like to remain subscribed to Prime instead of cancelling. As mentioned earlier in this report, cumulatively these dark patterns and Nagging can make it more likely for a user to abandon cancellation.
241. The issues raised above also occur on mobile and the switch in the wording on the buttons "Keep my membership", "Continue to cancel", and "Remind me later" may be less noticeable on the smaller screen. **Attachment S.** Again, a user will also have to spend more mental effort to choose the middle

button to continue to cancel.

**iv. Iliad's Cancellation Page**

242. The FTC asked me to assume that, on the next page of the Iliad, Amazon showed consumers five different options, only two of which, “End on [date]” and “End Now”—presented last, and at the bottom of the page—cancelled a consumer’s Prime subscription. **Attachment L.** Pressing any of the first four buttons took the consumer out of the Iliad without immediately cancelling.
243. The first and second options—“Remind Me Later” and “Keep My Membership”—were substantially identical to the buttons on the Iliad’s prior two pages.
244. The third option, “Pause on [date],” would “pause” or put on hold—but not cancel—a consumer’s Prime subscription. Amazon presented the “pause” option adjacent to a warning icon and text stating that, “[b]y pausing, [consumers] will no longer be eligible for [their] unclaimed Prime exclusive offers,” and provided links to “Prime exclusive offers” (which if clicked exit the Iliad without canceling).
245. The fourth option, “End on [date],” turned off Prime’s auto-renew feature, meaning that a consumer’s Prime subscription would terminate at the end of their current billing cycle.
246. The fifth and final option, “End Now,” immediately cancelled a consumer’s Prime subscription (and Amazon refunded a pro-rated amount for the balance of the billing cycle).

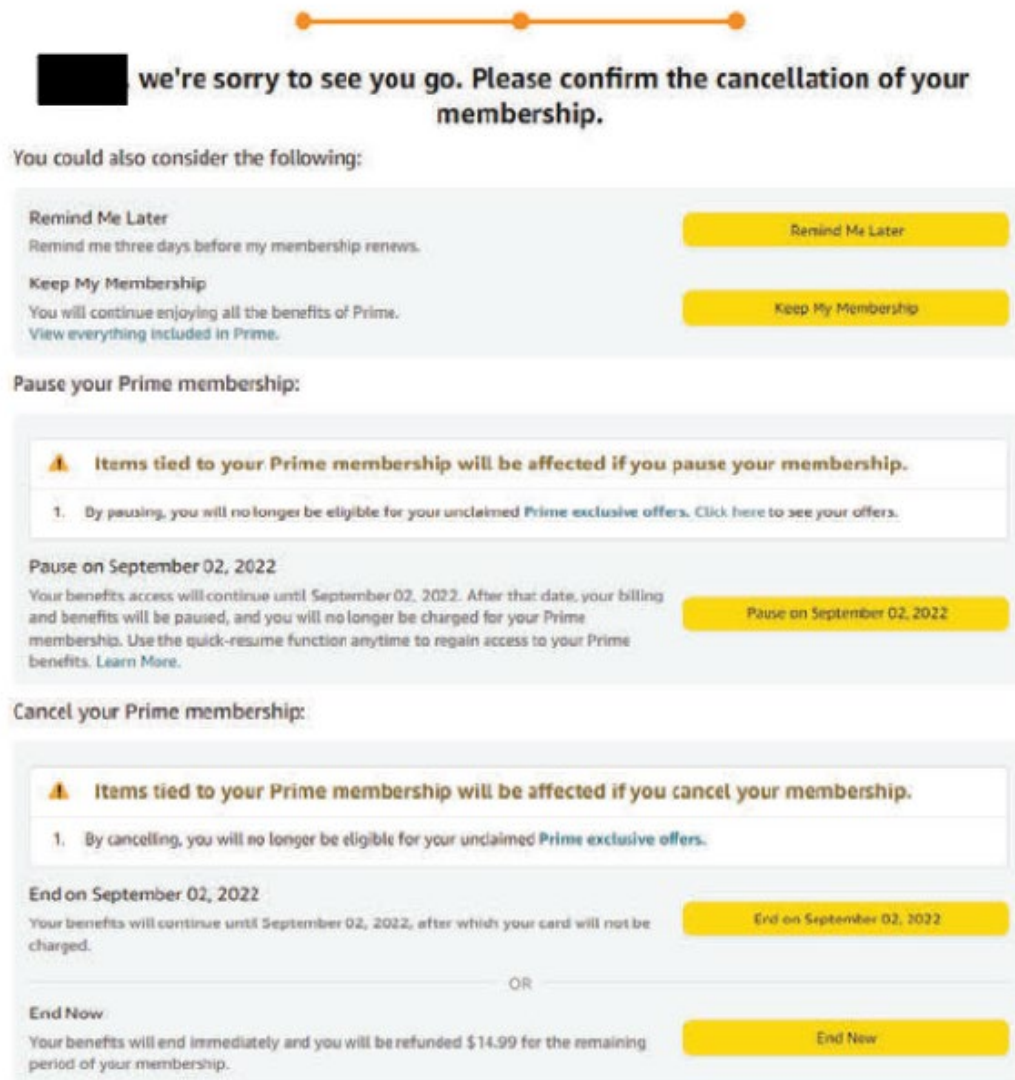


Figure 20: Iliad Cancellation Page

247. The above image is a screenshot of the Cancellation Page of the Iliad.
248. The Cancellation Page uses similar design as the prior pages to make it harder than necessary for a user to finalize their subscription cancellation and to distract users from cancelling.
249. The most prominent design techniques that Amazon uses on the Cancellation page are choice overload and lack of symmetrical choices. Amazon presents users with five button options, from top to bottom: "Remind Me Later," "Keep My Membership," "Pause on [next billing date]," "End on [next billing date]," and "End Now." The buttons are ordered in a hierarchical manner with the buttons that benefit Amazon the most at the top

(subscription retention) and the ones that harm Amazon the most at the bottom (subscription cancellation.) Additionally, Amazon introduces two new buttons that did not appear on any of the previous pages (the pause button and the end at the next billing cycle button), which demand the user to pay more attention to sift through them. The only two options that end a user's membership are the couple last ones at the very bottom of the page. The presence of the three other buttons is distracting to the user from successfully accomplishing their goal and cancelling their subscription. Amazon also distracts the user through the location of its text. The top of the page starts with "[Name], we're sorry to see you go. Please confirm the cancellation of your membership." However, instead of placing the cancellation options underneath, the very next sentence is "You could also consider the following," referring to the "Remind Me Later" and "Keep My Membership" options.

250. The repetition of the "Remind Me Later" button throughout the three pages is a design technique to wear down the user (a Nagging dark pattern). The user presumably has already declined to select the "Remind Me later" button at least twice when the user arrives on this last page. There is therefore very little, if any utility, to showing this option to a user again—for a third time—other than creating cognitive overload and adding more steps in the process. There is also a lot of text, particularly in a small font, on this page to "crowd" the physical space on the page. Amazon re-explains each of these two buttons, adding more distracting visual text to the page. Amazon then explains what the pause button is, as well as the two cancellation options at the bottom. When users see a lot of text on a page, they may either feel overwhelmed with the information overload or just gloss over the information to try and find the option they would like quickly.
251. Amazon also uses repetitive text that also adds barriers to the user's cancellation experience (a Nagging dark pattern designed to wear down the user). The "Items tied to your Prime membership will be affected if you cancel your membership" with the accompanying "1. By canceling, you will no longer be eligible for your unclaimed Prime exclusive offers" appears *twice* on the screen, after already appearing once on the Offers Page. Again, Amazon is crowding the page to distract the user.
252. Furthermore, Amazon, again, uses positive and negative framing to induce a sense of loss in the user by using warning icons that can make a user worried or concerned about losing items tied to Prime (like in the Offers page) and with the unclear wording "Items tied to your Prime membership will be affected if you cancel your membership." The wording "Redacted, we're sorry to see you go. Please confirm cancellation of your membership" is also framing this process as a loss and toying with the user's emotions.
253. The Iliad Cancellation page is likely to be more detrimental on a mobile

device since there is a lot of scrolling that a user has to do to find the “End now” option which is listed last. Users are more likely to click the first few options which keep them in Amazon Prime instead. In the Iliad flow, the option to continue to cancel is in the middle and the option to remind me later is at the bottom and has a blue highlight” on first page of Iliad. Iliad page 2 is similar – the option to continue to cancel is in the middle, and on Iliad page 3, a user has to scroll all the way to the bottom to “End now” and like desktop, a user has to get past all options to stay enrolled (pause/keep my membership/remind me later/end on specific date) first.

254. Therefore, to successfully cancel a Prime subscription, the consumer needed to find Iliad, find the right button to select on the Marketing Page, find the right button to select on the Offers Page, and find the right button to select in the Cancellation Page—while navigating dark patterns that could confuse them into *not* successfully cancelling.

**b) Overview and Cognitive Walkthrough of the Iliad 2.0 Cancellation**

255. The FTC asked me to assume that after April 2023, Amazon consumers who sought to cancel their Prime subscription would have to go through the Iliad 2.0 cancellation process.
256. The information presented in Iliad 2.0 is nearly identical to that in the Iliad. The key differences are:
- (i) the Offers Page is consolidated into a pop-up that Amazon displays if the consumer clicks on “Prime Plan Offers” on, and
  - (ii) all of the options presented in the Iliad Cancellation Page (Remind Me Later, Keep my Membership, Pause on [date], End on [date], and End Now) are presented to the consumer in an interactive way.
257. The FTC asked me to assume that the flowchart below shows the Iliad process from Prime Central on a desktop device.



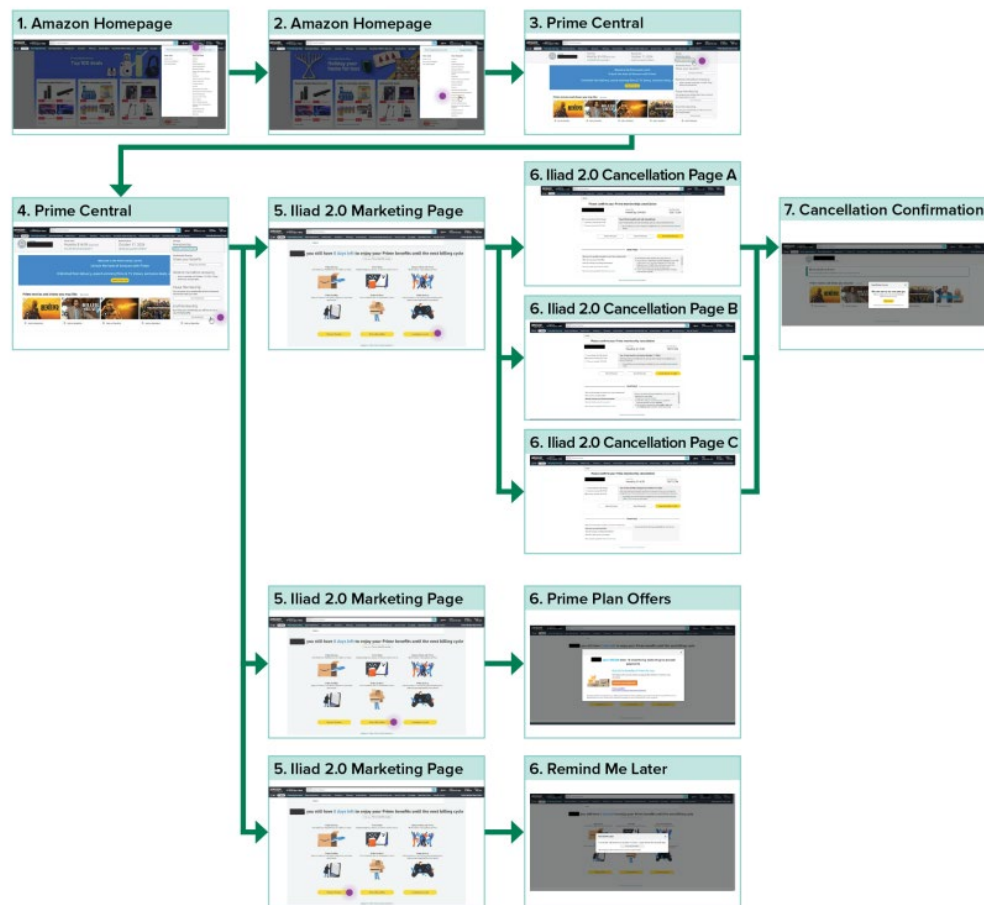


Figure 20: Iliad 2.0 on Desktop

### i. Finding Iliad 2.0

258. Consumers need to look for Iliad 2.0 in the same, or very similar, way they did the Iliad. *See supra*, Section VII(a)(i). **Attachment T.**

### ii. Iliad 2.0's Marketing Page

259. Similar to the Iliad Marketing Page, Iliad's 2.0 Marketing Page presents marketing information to consumers, i.e., the benefits the consumer would lose by cancelling Prime. **Attachment T.** A recent version of the Marketing Page consists of two rows depicting which Prime benefits the consumer can still "enjoy . . . until the next billing cycle": Prime Delivery, Prime Video, Amazon Music with Prime, Prime Reading, Exclusive Deals, and Prime Gaming.

260. At the bottom of the page, there are three yellow buttons that read, from left to right: "Remind Me Later," "Prime Plan Offers," and "Continue to Cancel." As with the Iliad, the "Remind Me Later" button removes the consumer from



the cancellation process. Consumers must select “Continue to cancel” at the bottom right to proceed. Clicking on the “Prime Plan Offers” button yields a pop-up that states “before you go, consider switching to” a different type of plan, i.e., annual to monthly, or monthly to annual, a student plan, or a “government assistance” plan. [See new flow]. The information in this pop-up is very similar to the information in the Iliad Offers Page. The only way for a consumer to proceed with cancelling Prime is to click on “Continue to Cancel.”

261. The below screen capture reflects the Cancellation Page of Iliad 2.0.

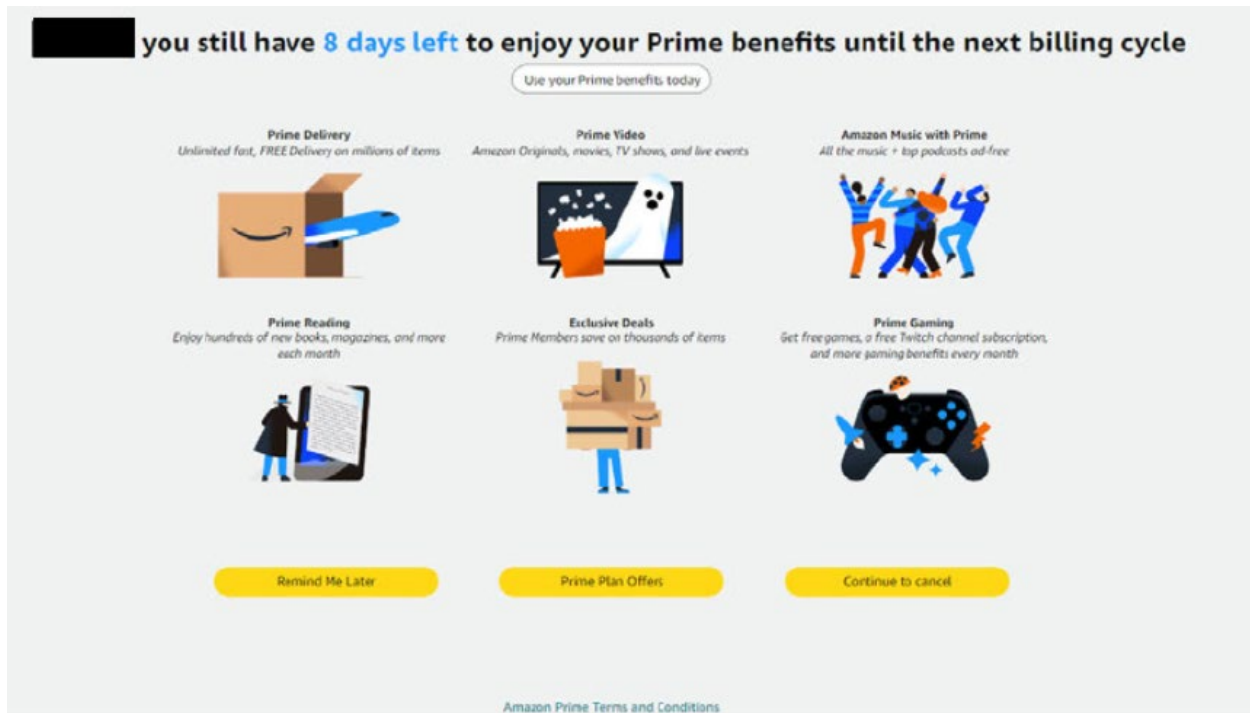


Figure 21: Iliad 2.0 Marketing Page

262. Though the Iliad 2.0 omits some of the dark patterns used in the Iliad, it still contains problematic design choices that make it more difficult than necessary for users to cancel their subscription.
263. The Iliad 2.0 Marketing page contains elements that are similar to, yet only slightly different from, the Iliad’s Marketing page.
264. Like the Iliad’s Marketing Page, the Iliad 2.0’s Marketing Page contains information that is nearly exclusively focused on Prime benefits. All six images on this page relate to a type of benefit associated with Prime. The only location on this first page that has any connection to cancelling a Prime subscription is the yellow button labelled “Continue to Cancel.”

265. This Marketing page also continues to use choice overload, asymmetric choices, and unclear language with respect to the “Remind Me Later” button. When a consumer clicks on that button, a pop-up appears, displaying “A reminder will be sent on [date], 3 days before the renewal date.”

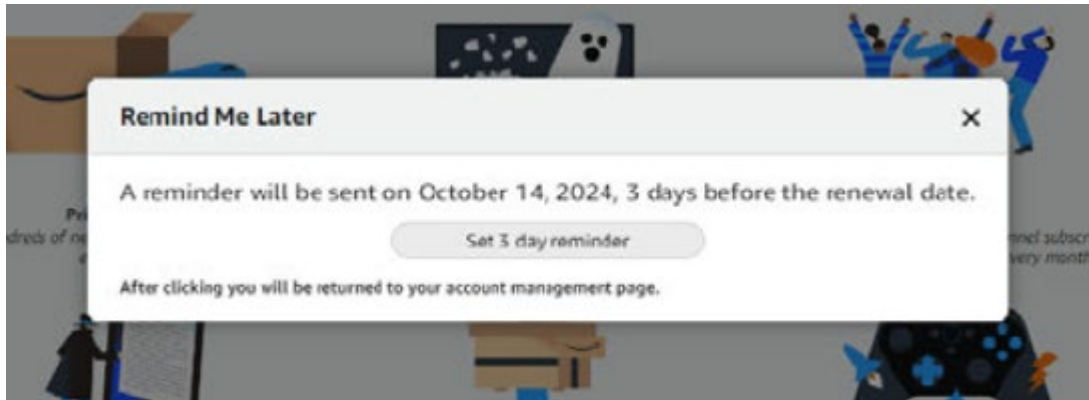


Figure 22: Iliad 2.0 Remind Me Later Pop-Up

266. Amazon also replaced the “Keep My Benefits” button with a “Prime Plan Offers” button. The language for the “Prime Plan Offers” button is vague and a user may need to click on the button to figure out what it means, distracting them from cancelling their membership. The “Prime Plan Offers” button is essentially the Offers Page from the Iliad.

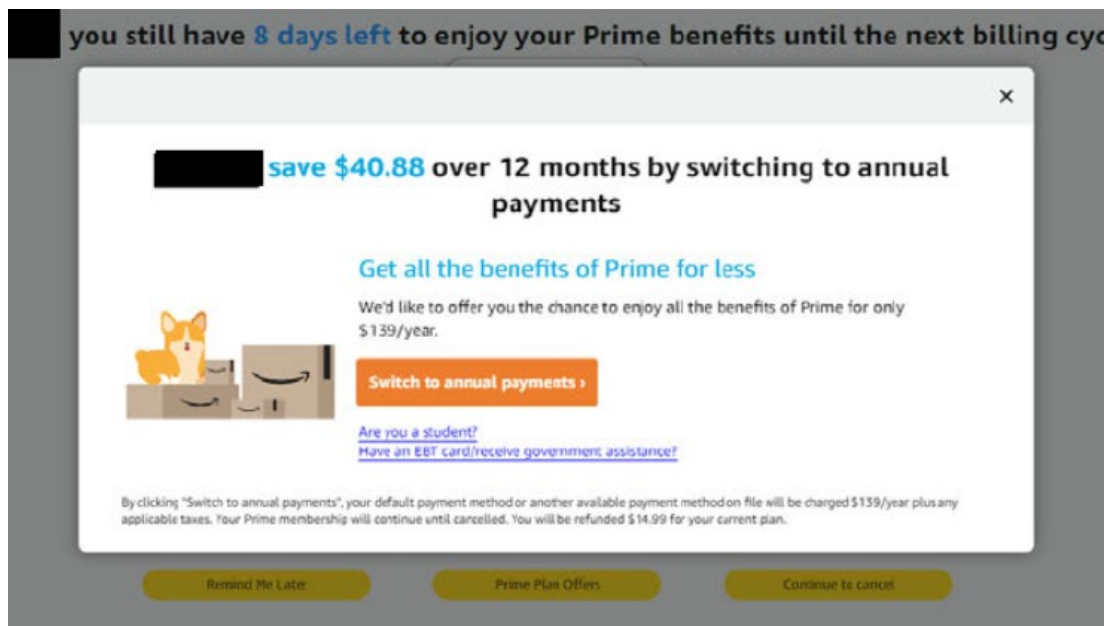


Figure 23: Iliad 2.0 Prime Plan Offers Pop-Up

267. There are some improvements from the Iliad. The “Continue to cancel” button has been moved to the right, which is where a user is likely to click to advance to the next set of screens. Moreover, all the buttons are now the same color and size which is better. **Attachment T.** However, even with these changes, a user may still be more likely to exit the cancellation flow than to continue to cancel.
268. The mobile Marketing Page suffers the same issues as the desktop. **Attachments U and V.** The Remind me later, Prime Plan Offers, and all the listed benefits all could distract the user from completing the cancellation process. “Continue to cancel” is listed as the last option a consumer could select.

### iii. Iliad 2.0’s Cancellation Page

269. After a consumer selects the “Continue to cancel” button on the Marketing Page, the Cancellation Page appears, presenting the consumer with options that either 1) remove the consumer from the subscription cancellation process, 2) pause the subscription, 3) remind the consumer to cancel at a future time, or 4) cancel the subscription. The top of the page states “Please confirm your Prime membership cancellation” with the consumer’s name, plan, and next billing date right below.
270. The page is primarily comprised of a chart that shows different information on the right side of the chart based on the option the consumer selects on the left side of the chart. The buttons at the bottom of the page also change based on the selection in the left-side of the chart. The three options on the left side of the page are: “Cancel today” (with the prorated refund amount), “Cancel on renewal” (with the renewal date), and “Pause on renewal” (with the renewal date).
271. When the consumer selects “Cancel today,” the right side of the chart reads: “Your Prime benefits will end immediately” twice, “you will be refunded [the prorated amount],” and “By canceling, you will no longer be eligible for your unclaimed Prime exclusive offers.” The buttons at the bottom read: “Keep Membership” and “End Membership Now.”
272. When the consumer selects “Cancel on Renewal,” the right side of the chart reads: “After that [renewal] date your benefits will end, and you will no longer be charged for your Prime membership.” It also contains information on Prime Video Channel subscription continuing until the Prime Membership Ends, other Amazon household members losing access to Prime benefits, and no longer being eligible for unclaimed Prime exclusive offers. The button options at the bottom are “Remind Me Later,” “Keep Membership,” and “End on [Renewal Date]”.
273. When the consumer selects “Pause on Renewal,” the right side of the chart

reads the same as the “Cancel on Renewal” text, except that the Prime benefits will be “paused” instead of ending. The buttons at the bottom are identical as well, except for “Pause on [Renewal Date]” replaces “End on [Renewal Date].”

274. Below is a representation of Iliad 2.0’s Cancellation Page.

Figure 24: Iliad 2.0 Cancellation Page

275. Iliad 2.0’s Cancellation page presents the same three options as in the Iliad’s Cancellation Page, but in a format that is more cognitively challenging for the user to understand and subsequently select a cancellation option. Unlike the Iliad flow, Iliad 2.0 offers the user a selection via three radio buttons, one to cancel immediately, one to cancel on renewal, and one to pause on the next renewal. Two of these options require one more billing cycle before cancellation is finalized. Iliad 2.0 is an improvement over the Iliad since it no longer has the warning icon used in the Iliad but rather the dark patterns identified earlier, including obstruction, persist.

276. Another change in Iliad 2.0 is that the first option listed is “Cancel today”, which if selected has the buttons “Remind me later”, “Keep Membership”, and “End Membership Now”. The “End Membership Now” button is listed on the far right and is the only yellow button which is an improvement over

Iliad since users are likely to click this option to advance to the next screen. The screen also specifies the refund amount, which is helpful for a user deciding to cancel their subscription.

277. The Cancellation Page in Iliad 2.0 is still confusing and violates principles of good design since the options change if the consumer changes the radio button selection to “Cancel on renewal,” “End on [today]” or “Pause on renewal.” This also means a user must carefully read the text changes in the box about the Prime benefits since this also changes depending on which radio option is selected – if a user is not paying attention, they may confirm without reading carefully and not cancel their subscription even if they intended to cancel.
278. Also, no matter which radio option is selected, each option still has the “Remind me later” and “keep my membership” buttons in addition to the button to confirm the radio option selection. These options are now not colored yellow so they are less prominent but still provide the user with more options to abandon cancellation than not.
279. Iliad 2.0’s Cancellation Page on suffer the same issues that could confuse a user with all the button text changes as a user switches radio buttons on this page. **Attachment U.**
280. The Cancellation Page on mobile has the same information as on desktop, but the format is harder for a consumer to navigate. The consumer must scroll down to confirm cancellation, past the remind me later and keep membership options. **Attachment V.**
281. Therefore, to successfully cancel a Prime subscription through Iliad 2.0, the consumer needed to find Iliad 2.0, find the right button to select on the Marketing Page and find the right button to select in the Cancellation Page—while still navigating dark patterns that could confuse them into *not* successfully cancelling.

**The Prime Cancellation Process on Desktop and Mobile Devices Is Confusing and Is Not Easy to Find and Complete.**

282. Finding and completing the Iliad violates foundational good design principles, as the process is rife with manipulative designs that make the process longer and more difficult than necessary, cause confusion, and create cognitive overload.
283. To successfully cancel through Iliad, a user is forced to navigate a four-page, six-click, fifteen-option process at minimum. Therefore, it takes more clicks for a user to cancel a Prime subscription than to enroll in one through the online product checkout flow. Additionally, the user must click on the right buttons to get through the entire Iliad process; if they select the wrong button,

they need to restart Iliad from the beginning.

284. One particularly pervasive problem in the design of the cancellation process is that consumers might abandon Iliad after selecting a button with the word “cancel” in it because they believe that they have successfully cancelled upon selecting that button. This is especially the case for people who may be seeking to quickly cancel their membership on a mobile device, as those individuals would likely be operating under a System 1-type of thinking.
285. Though the design of Iliad 2.0 is improved over Iliad in certain respects, Iliad 2.0 is still not simple for consumers to find and complete. The entry points are the same as for the Iliad, and, as a result, cause the same challenges for consumers as described in paragraphs 210-215. Similarly, Iliad 2.0 includes much of the same extraneous information about Prime benefits as Iliad and presents too many options in the Cancellation Page, posing the same difficulties described in Sections VII(a)(ii)-(iv).
286. The dark patterns in cancellation are more prominent on the mobile Iliad and Iliad 2.0, making it even harder for consumers to cancel on a mobile device. Consumers spend more time reading information at the top of the page or screen and are more likely to just choose the first option. Also, the last stage in the cancellation process requires more scrolling to get to the cancel option which is presented last on the mobile device, again likely to lead to fewer cancellations when users want to preserve the status quo of staying subscribed to Prime. **Attachment S.**

#### **VIII. Think Aloud User Study Of Amazon Prime Enrollment and Cancellation Screens**

287. As I explained in the Methodology section, *see supra*, Section V(d), after identifying the dark patterns and confusing aspects of the interfaces I examined, I gathered empirical evidence through a think aloud study on consumers’ interaction with interfaces that are near-identical to the Prime enrollment detours in the checkout process and cancellation processes to verify and elaborate on the results of my cognitive walkthrough study.
288. I conducted this qualitative work with a PhD candidate whom I advise in the Department of Computer Science at the University of Chicago, Brennan Schaffner, and a website builder who is an undergraduate student majoring in Computer Science at the University of Chicago.
289. The goal of this study was to ascertain how susceptible users are to selecting options in the Amazon interfaces that did not correspond with their intent—specifically to determine what points of confusion, if any, consumers encounter when navigating these processes.



**a) Methods for the Think Aloud Study**

290. Mr. Schaffner and I (“we”) conducted the think aloud user study from April 25 to May 15, 2024, on weekdays between 9am and 6pm. Specifically, we conducted a pilot study on April 25 and 26, 2024 and the main study from May 1 to 15, 2024.

**b) “CandyForever” Website Design and Implementation**

291. To ensure that users acted as they would if they were using a real website, we needed to ensure the system looked and behaved like a real-world service. We therefore created a fictional website called CandyForever modeled on the Amazon enrollment detours in its online product checkout and cancellation processes. CandyForever displayed different types of candy as its inventory. We also created a subscription named “Premium,” modeled on Prime, which offered shipping benefits akin to Prime.

292. We designed the CandyForever website to match the aesthetics of the Amazon website (including its online checkout and cancellation processes) as closely as possible. We used the same visual styles as seen on the Amazon website and screen captures of the Amazon checkout and cancellation processes that the FTC provided us. The main differences between the CandyForever website and the Amazon website were the color scheme, the sale inventory, the slogans, and logos, which depict a fictional candy store selling a variety of international and domestic candies. We included those differences to avoid confusing consumers who would have recognized the Amazon website.

293. We did not use the live Amazon website to test users’ responses because we did not have access to the website backend. Moreover, we wanted to test versions of the online product checkout process with Prime detours, and cancellation processes that were no longer displayed on the Amazon website at the time of our study. We also wanted to control which version a particular user would see during the study. During the study, we ensured that a third of all participants saw each version of the Prime detours in the checkout process we were testing.

294. We conducted the study on a desktop device (as opposed to mobile device). According to many studies of mobile interfaces and interactions, design issues are compounded on mobile devices where users have a smaller screen, are likely to be multi-tasking, and under more cognitive load. [64,82,97]. Thus, to frame the study conservatively and most favorably to Amazon, we conducted the study on a desktop device. This represents a lower bound for uncovering problematic issues, which are likely heightened even further on mobile devices. , which would frame the study in the light most favorable to Amazon. According to many studies of mobile interfaces and interactions, design issues are compounded on mobile devices where users have a smaller



screen, are likely to be multi-tasking, and under more cognitive load [64,82,97].

295. In the CandyForever checkout processes, CandyForever Premium equates to Amazon Prime. Thus, the CandyForever checkout has the same upsells to be enrolled in CandyForever Premium that someone shopping for a product on the Amazon website would receive to enroll in Prime. Similarly, to cancel CandyForever Premium, participants must go through the same cancellation processes as they would to cancel Amazon Prime.

296. We built CandyForever using several technologies. The website has both a front-end and back-end component.

(i) The front-end component created the visual and interactive components that users could see on the CandyForever website. The front-end code is hosted on Netlify, a service that also provides a public URL to the website. Auth0, an authentication platform, is integrated into the front-end of the website. As a result, anyone attempting to access the site through the public URL must verify their email address. Only those whose email addresses (i.e. the research assistant, the website builder, and I) were on a predefined whitelist and able to access the website's content. We developed the front-end with React.

(ii) The back-end component, which involves creating the systems that store and process data and ensure that the website runs smoothly, is written with Node.js and connects to a MongoDB database, which has two schemas: session and actions. When the back-end receives information from the front-end, such as session start and button clicks, it updates the MongoDB database which was stored in the cloud accordingly. This allowed us to store information about the location of each click during a user study session. Data stored on the MongoDB database server for data analysis purposes was password protected to prevent unauthorized access.

297. For enrollment detours, we tested the MPP checkout process with three different versions of the UPDP Prime detour. All three versions had Attachment D as their base. When selecting checkout processes to test, we ensured that we did not select the versions of the pages (SOSP, UPDP and SOSP PDP, and SPC) that I had identified as having the most manipulative designs during my cognitive walkthrough. Instead, we chose processes that had a set of representative problematic issues suitable for testing with users. The first UPDP version we tested was from **Attachment D**. The second version of UPDP we tested was based on **Attachment H**, and the third version of UPDP was based on **Attachment I**.

298. For cancellation processes, we tested the Iliad process.

299. The CandyForever website includes a hidden page for starting or ending a session. Each session is assigned a unique start time, end time, and session identifier. This hidden page also allows the research assistant to enter notes and a participant identifier, both of which are associated with the session. Because we had three versions of the UPDP page and the SOSP page, the research assistant selected which version of the enrollment flow to test for each participant using the hidden settings page. All actions on the website, such as clicks on buttons or other elements, or redirects to another page within the site during an active session, are recorded and logged to the backend. These actions do not include any personal information of the study participants.

300. The research assistant used his computer to access the front-end website, and restart the website session for each new participant. The research assistant's laptop was connected to a large screen monitor, keyboard, mouse, and microphone in a user study room dedicated to the study.

### c) Considerations to Achieve Study Realism and Mitigate Limitations

301. As explained above, we carefully designed CandyForever to match Amazon's processes and perform our user testing in a controlled environment.

302. We interviewed participants in person so we could observe their actions and behaviors in real-time and control the study environment.

303. To ensure that users acted as they would if they were using a real website (also known as "study realism") we used a *deception or incomplete disclosure* technique [4], which is widely used in HCI studies to gather information in a manner that more closely represents reality by not revealing the true purpose of the study. [46,78]. Deception studies allow researchers to mask the real reason for a study task or study and have a debriefing section at the close of the study to reveal the true nature of the study [4]. Deception studies in HCI are often used to study users' behaviors and interactions without biasing them with the real purpose of a study [46]. For instance, in one security-related study, researchers did not tell participants that they were studying how users entered passwords on banking sites and deceived them to believe that their connection to a bank site was less secure than it was in reality [77]. This allowed the researchers to mimic how users would feel if they were at risk in a real-life situation. Best practices for a deception study include following ethical principles of working with human subjects, such as not harming participants, and revealing the true nature of a study when it is completed and debriefing participants about the deception used and the reason for using it. [4,46,78]

304. In our case, to study Prime enrollment and cancellation in a realistic setting, we decided to tell participants that 1) CandyForever was a real business, 2) it

hired us to evaluate their site, 3) participants would receive the candy they purchased by mail, 4) they were enrolled in CandyForever Premium (regardless of whether or not they did so after going through the CandyForever online product checkout flow), 5) they would be billed if they did not cancel within the study session, and 6) they would keep unspent money left over on the giftcard we provided for purchasing candy. At the end of the study, we revealed that CandyForever was not a real business and provided debriefing documentation, which is a sheet explaining the real purpose of the study was to test interaction flows on a shopping website.

305. The CandyForever background was set up to incentivize users to be thrifty so as to maximize their additional monetary compensation from the gift card and make the Premium options more realistic given the promise of free shipping. This helped to create a situation where participants were motivated to shop and to think free shipping could be useful since they could save and reclaim the money remaining on the gift card by lowering their shipping costs—i.e., more akin to what a real shopper on Amazon might consider.

306. The CandyForever background was necessary to allow participants to speak freely about the website design and their experience navigating it and to have a plausible reason as to why we were not able to cancel their subscriptions ourselves (since hired website evaluators would likely not have access to the CandyForever backend system.) In short, CandyForever allowed us to approximate more closely how consumers feel when they go through the enrollment detours and the cancellation processes in the real world.

307. Additionally, we designed the study to create the best-case scenario for participants and an environment with ideal conditions, as compared to real life Amazon consumers. We did not place participants under any time-pressure; we provided them a large screen to look carefully at the flows; and we incentivized them to both purchase an item and cancel a subscription. Participants were also asked to think aloud to reflect on their actions, which gave them more time to look at each page in the interface flows than a consumer in a real-life scenario. Participants were also more likely to complete the tasks they were given, such as cancelling their subscription, since we expressly asked them to do so and they were being compensated to complete the study tasks. This study design therefore reveals fewer issues than what is likely to happen when people use Amazon in their day to day lives where they may be doing many tasks at the same time, where they may be under time pressure, or where they may be on a smaller screen/device. In essence, the study design favors Amazon by providing the most ideal environment of use for a study participant.

308. During the study, we strived to make the participant believe they were really testing CandyForever. We prepopulated the interface with their information before they arrived, we maintained that we were hired by CandyForever to

test the site until the study concluded, and we reiterated that the goal was to evaluate CandyForever throughout the study session. While this cannot precisely mimic a real life scenario of usage, it is as close to using Amazon in the real world as we could have gotten in a study environment. We also implemented our best efforts to ensure that participants believed that they could be sent real invoices and actual candy from CandyForever by entering their mailing address in the CandyForever system, which we recorded from the preceding recruitment process.

309. We provided a gift card to participants to use during the study, instead of their own credit cards, for study realism and user privacy. In particular, each participant used the gift card to enter billing information to complete their purchasing task, so no personal credit card information was disclosed. We preserved study realism by telling participants they could keep any remaining balance on the gift card after their purchase to motivate them to be mindful of price and their purchase.

310. Typically, the number of participants needed in a qualitative study to identify major flaws in design issues is five to twelve [9,46]. In our study, we had 33 participants, including 3 in the pilot.

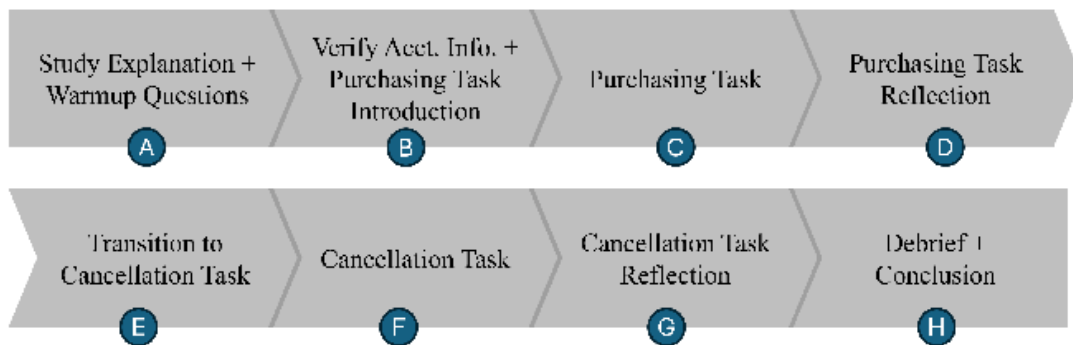


Figure 25: Overview of Study Protocol

#### d) Study Protocol

311. As is typical for HCI user studies, we created a study protocol, which outlines the plan for the study to ensure all sessions are run consistently [19,46,72,78].

312. The main considerations for creating the study protocol were to answer the following research questions:

- (i) How do users enroll in Amazon Prime via online checkout? This included asking what points of confusion exist in this process, if any.

- (ii) How do users cancel their Amazon Prime subscription? Similarly, this research question also asked what the points of confusion, if any, are in the cancellation process. In the cancellation task, we wanted to make sure that participants were incentivized to successfully cancel their subscription because they were instructed to by the research assistant.

We assumed that in a study setting, other detractors (such as changing to or from a monthly plan, potentially getting lost finding the cancellation ingress) would not work affect participants as they could on consumers in the real world. An overview of the study protocol is shown in .

313. During each study session, the research assistant posed as a usability consultant hired to test CandyForever's live website. The study sessions lasted a median time of 27 minutes with a range of 19-44 minutes. To minimize participant bias of being positively inclined towards a system we developed [20], we chose to not represent ourselves as from CandyForever and instead we posed as third-parties. This is in line with think-aloud studies where the participant is assured their performance is not being evaluated but rather that their evaluation of a system is being considered [46,47,78].

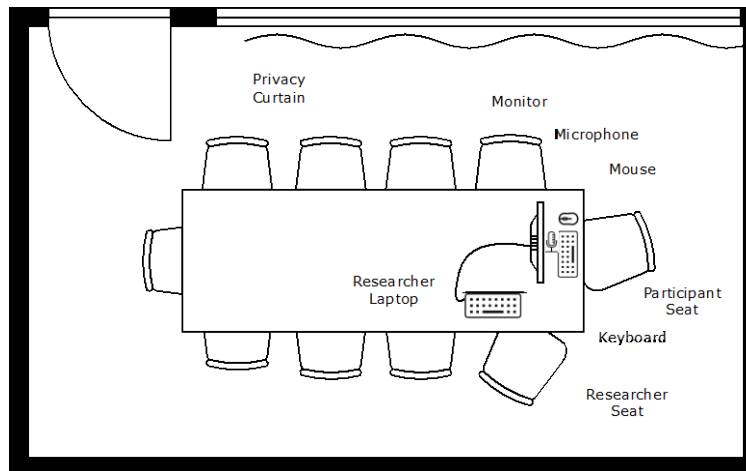


Figure 26: Study Room Setup

314. The room was set up so that the participant had a separate screen for navigating the CandyForever website which was linked to the research assistant's laptop as shown in Figure 26. The participants could not see the research assistant's laptop screen and each participant also had their own external mouse, keyboard, and microphone.
315. We audio recorded all study sessions and videorecorded the participants' screen using Zoom. This audio and video data collection is typical for HCI studies [23,46,78] since it captures all the details of each participant's session and data that can be systematically analyzed to derive insights and conclusions about the research questions the study was designed to answer.

316. Prior to a participant's arrival, the research assistant entered the participant's details so it appeared they already had a real account with CandyForever. This gave the appearance of a real working site with the same information that is typically shown on Amazon when a user is signed in. In addition, when participants entered the room, the research assistant reassured them that the site was real and working by first confirming their account details. Specifically, the research assistant asked the users to confirm the information was correct and to complete a study consent form as is typical for HCI studies [23,46,78] which outlined the study procedures, the compensation they would receive, and details of the researchers conducting the study. The consent form also asked the users to consent to audio and video recording of the session.
317. The research assistant would then point to the part of the screen that was personalized and displayed "Hello <ParticipantName>" and pointed out that the user was already signed into their CandyForever account.
318. The research assistant first introduced participants to the study format by telling them about our role as usability consultants and asking them a series of warm up questions about their online shopping habits and likelihood to use a website like CandyForever to purchase candy. The research assistant explained that the website was live, the whole inventory was not yet populated on the site, and that we had created a test account with their personal information including their name, email address, and mailing address. The research assistant then muted the microphone to confirm these details with the participants (muting to protect participant privacy) and unmuted again to continue the recording. The research assistant then instructed participants on each task and asked them to "think aloud" and tell us what they were thinking as they were doing the task. The research assistant reminded participants that he could not help them during the tasks but would prompt them to think aloud at any time if they were not already doing so. Participants were also told explicitly that their actions were not under scrutiny and that the sole purpose of the study was to gather feedback on the website for the company and that they were not under time pressure. The minimal prompts used were "*What are you thinking now?*" and "*What do you think you would do next?,*" etc.
319. To answer our research question about enrollment and cancellation processes, participants were asked to complete two tasks:
- (i) To purchase a product through the CandyForever online checkout (to see if the participant would enroll in CandyForever Premium while doing so); and
  - (ii) To cancel CandyForever Premium after subscribing (to see how the participant would fare.)

320. The first task was designed to answer questions on whether participants understood whether they enrolled in a CandyForever subscription and, if yes, whether participants were aware of the cost of CandyForever and when and how often they would be charged for their subscription. To answer these questions, we asked participants to buy up to \$20 of candy and think-aloud on each screen as they did so.
321. At the end of the first task, the research assistant revisited the online checkout with the participant and asked them to explain what they were thinking for each screen. Participants were also asked to recall the terms of the Premium subscription, i.e., the cost of Premium, when and how often they would be charged for Premium, and the fact that Premium was a subscription service. They were also asked if their enrollment choice for Premium matched what they had intended to happen during the task.
322. The second task in our study protocol was designed to see if participants encountered any problems when trying to cancel a CandyForever subscription. This made it necessary to ensure all participants were enrolled in CandyForever Premium at the end of the first task to achieve our deception that they may be charged for a CandyForever Premium subscription fee if they did not cancel their subscription before leaving the study room. Therefore, after the first task was completed, our system automatically enrolled the participant in Premium, even if they did not choose to enroll, so that we could initiate our deception protocol for the cancellation task. In a few cases, the system did not automatically enroll the participant and in those cases, the research assistant took control of the participant's screen, hid the screen, and enrolled them into CandyForever manually before unhiding the screen and returning it to the participant's control. This ensured that the participant was enrolled in Premium for the deception.
323. After participants completed the first task and the review, the research assistant then began the deception protocol for the second task to tell the participant that they had enrolled in Premium (regardless of whether they had done so or not). The research assistant emphasized that CandyForever would start billing them if they did not cancel their subscription during the session. In cases where the participant insisted that they did not enroll in Premium, the research assistant said that the site may be buggy to keep up the deception. The research assistant also mentioned that they would not be able to access the CandyForever website from home to cancel the subscription at a later stage.
324. If the participant had any problems during the process, the research assistant encouraged them to keep going with minimal assistance. After the cancellation was complete or not, the research assistant reviewed the screens with the participant to ask about whether the choices they made aligned with their intentions.



325. The research assistant then revealed that the participants were not ever at risk of receiving a bill for enrolling and that this deception was to help facilitate the study.

326. After participants completed the study, the research assistant debriefed each participant about the deceptions used—explaining that CandyForever was not a real website, that they would not receive any bills or candy in the mail, and that they would get a \$15 bonus card instead of the remaining money on the gift card. The \$15 was always greater than the amount that would have been remaining on the gift card because the least expensive item on CandyForever cost more than \$5. Participants also received a form informing them that this study was for a federal governmental agency and providing them with information on how to opt out of the study. Participants were also offered free candy.

#### e) Study Recruiting

327. We used a recruiting company to ensure that we reached a diverse sample of participants in a reasonable amount of time. Recruiting companies solicit participants from the general population for studies according to specified criteria, handle the compensation for participants, and book the participants for study sessions, thus simplifying the handling of the study logistics which would otherwise have to be performed by a research team [27,46]. Each participant completed a consent form and was compensated either \$150 (before 4pm rates) or \$125 (after 4pm rates). Rates were set by the recruiting company. In addition to the base compensation, as described above, all participants were given a bonus amount of \$15 in lieu of the remaining credit on the gift card they were given during their enrollment tasks.

328. We used a recruiting agency based in Chicago, Focusscope, Inc., to recruit participants from a range of age groups, income ranges, and education levels to match the demographics of Amazon shoppers [108,109]. The agency collected these criteria for screening participants and provided it to us as the study progressed. We also aimed to get a range of users with experiences online shopping matching the US population [87]. We also asked participants to rank which three websites they most frequently visit for online shopping in addition to asking them how often they shop online. We aimed to get a range of users who were familiar and less familiar with shopping on Amazon.

329. During each participant session, we recorded video of their on-screen interactions including audio of their think aloud thoughts and the research assistant's questions. We also logged each click they made on the screen to a Mongo database stored in the cloud and password protected for access by the research team only. The research assistant also took brief notes about each participant. During the study, we ensured that a third of all participants saw each version of the enrollment flows we were testing.

## f) Participant Demographics

330. The participant demographics are key to understanding the context of a HCI qualitative study. It is therefore typical in HCI studies of all kinds including qualitative studies to collect demographic information about the people who take part in a study [19,27,46,72,78]. This allows researchers to understand the effects of individual characteristics on the study, the potential limitations of the study, and how to interpret the results given who participated [19,27,46,72,78].

331. Thirty-three participants took part in the study, including the three pilot participants as shown in Table .

332. As explained in Section V(c), a qualitative data analysis is not meant to produce statistically significant results, but it is common to report the number of participants who talked about or encompassed a certain theme to give an indication of the prevalence of that theme. The numbers reported are given to show how themes were spread across the data.

Age Range	Pilot # of Participants	Study # of Participants
18-26	1	6
27-42	1	8
43-58	1	10
59-77	0	6
<b>Income Level</b>		
< 50 K	0	12
K	1	13
>100 K	2	5
<b>Education Level</b>		
High School Graduate	1	5
Some College	1	11
College Graduate	1	10
Advanced College Degree	0	4
<b>Frequency of Online Shopping</b>		
Once or twice a week	0	8
Once every two weeks	2	10
Once a month or every few months	1	9
Less than every few months	0	3

Table 2: Participant demographics and online shopping habits

333. In the pilot study, all three participants were male with one being a frequent Amazon user and listing the site as one of their most frequently visited sites. The other two participants were infrequent Amazon users with one selecting Amazon as one of their most frequently visited sites but also reporting that they only shop online once a month or every few months. The remaining participant did not select Amazon as one of their most frequently used sites. Two participants were unemployed and one drives trucks.
334. In the full study, there was an even gender split with 15 male and 15 female participants. The age range of participants was 18-77 with the distribution of participants shown in Table . Half of the participants were frequent Amazon shoppers and listed Amazon as one of their top three most visited sites. The other half were infrequent Amazon shoppers; 8 did not select Amazon as one of their most frequently visited sites and 7 selected Amazon as one of their most frequently visited sites but only shopped online at least once a month. Participant occupations were varied and included office manager, police officer, consultant, customer service, director, clerical, driver, and homemaker. Three participants were retired, 3 were unemployed and 3 did not provide occupational information.
335. Notably, the majority of participants (19/33) commented out loud that the CandyForever website looked like Amazon and participants were eager to receive their candy. In fact, many participants were disappointed when we told them they would not receive their candy. This suggests that the site realistically conveyed the Prime experience to participants.

**g) Pilot Study**

336. Prior to conducting the study, we ran a pilot study to 1) test out the study protocol, 2) ensure participants were able to complete the tasks we set out and understand our instructions, and 3) ensure the data we were collecting answered the research questions we set out. Running pilot studies helps to iron out wording issues, ordering issues, and give a sense of the time needed for running participants in the full study. It is typical to run pilot studies in HCI studies prior to running a full study to ensure that the protocol is sound and to enable a research assistant to practice facilitating sessions [19,27,46,72,78]. It is also common to make adjustments to an interface or study questions along the way depending on how participants are reacting to the study protocol and tasks [19,27,46,72,78].
337. We ran three pilot tests on April 25 and 26, 2024 between 9am and 3pm. Pilot sessions lasted a median time of 24 minutes with a range of 19-40 minutes.
338. During the pilot studies, we noted a few places where links were missing from the CandyForever website and corrected those gaps. Additionally, we tested another version of the deception where for task two (cancellation), the

research assistant left the room to “contact the company” after telling the participant that they were enrolled in Premium to see whether the participant could cancel Premium without assistance. However, without the research assistant present to ensure that the participants were complying with the think-aloud protocol, participants did not provide as much information about what they were doing on each screen. This therefore limited our ability to determine what participants were thinking as they were navigating the cancellation task. For the full study beginning on May 1, we amended the deception to have the research assistant remain in the room (and not attempt to contact the company regarding the cancellation) and instead use a think-aloud protocol to determine what participants were thinking during their attempts at cancellation. We also amended the protocol to ask about Premium costs, frequency of charges, and what the subscription entailed.

#### **h) Data Analysis**

339. To analyze the data, we used a qualitative data analysis tool called MaxQDA. Qualitative data analysis is a systematic way of labelling qualitative data and deriving themes from the data in a principled manner [19,72,78]. First, my research assistant and I transcribed all the video files using MaxQDA’s automated transcription tools. I note here that the transcription quality was of high enough standard for analysis and in places where the automated transcription missed words or incorrectly transcribed words, we primarily relied on the video audio to ensure that we were analyzing what each participant said accurately. My research assistant and I then discussed and developed a code book, which is a set of labels for events of interest in the videos and transcripts and points at which participants had misconceptions about what was occurring in the interface.
340. For each code, we watched the participant video, noting movements of the participant’s onscreen cursor and what they said (from the audio recording and transcript). We looked for pauses in interactions and speaking and for what participants said to ensure we had sufficient information to apply our coding scheme. We then applied the code where relevant.
341. Once we coded all the data, I performed a thematic analysis of the data. [19,27,46,72,78]. This included creating a summary spreadsheet to track how each code applied to every participant.
342. For instance, we applied the code “Enrolled” for participants that enrolled in Premium using the UPDP page, the SPC stripe, or the SPC shipping options in the checkout processes. We coded all other participants as “Not Enrolled”. We also applied a code to say how a participant enrolled—e.g. “UPDP” if they enrolled by selecting the option for Premium on the UPDP page. We coded for “Whether read UPDP fineprint” if they read the UPDP fine print on the bottom of the UPDP page by using heuristics like navigation speed,

visual indicators like highlighting text with their cursor, and audio indicators like reading text out loud when considering when to apply this code to a participant. For instance, e.g., P8 traced their cursor along the fine print at the bottom of the UPDP page and read out loud: *“I authorize you to charge your default payment method on file after your 30 day free trial.”* We coded all other participants as “Did not read the fineprint.”

343. For “Whether Knew Premium Cost”, we applied a code if the participant could state the monthly price of Premium that was advertising during the checkout process. All other participants were coded as “Did not know the cost of Premium”. A similar coding process was applied for whether participants knew the benefits of Premium.
344. If a participant had the code “Enrolled” and not any of (“Did Not Know Cost of Premium”, “Did Not Know Charge Timeline of Premium”, or “Did Not Understand Benefits of Premium”), we applied a code “Informed Enrollment”. All other participants who were “Enrolled” were considered “Uninformed Enrollment”.
345. If a participant clearly indicated that they did not mean to enroll in Premium, we applied a code “Accidental Enrollment”. This is a lower bound for accidental enrollments since we were conservative in labelling these cases.
346. A similar process was used to code the cancellation process for understanding whether the cancellation process was complete, if participants had trouble finding the cancellation options, whether the research assistant had to help participants find cancellation, and if there were additional cancellation issues such as onerous cancellation.

UPDP Version	Participants	SOSP
V1 (MC14 Page 14)	P1, P4, P7, P10, P13, P16, P19, P22, P25, P28, P31	<i>None</i>
V2 (MC18)	P2, P5, P8, P11, P14, P17, P20, P23, P26, P29, P32	Yes - (MC 24 Page 5; after shipping and before billing)
V3 (MC22)	P3, P6, P9, P12, P15, P18, P21, P24, P26, P30, P33	<i>None</i>

Table 3: UPDP and SOSP version (if relevant) that each participant was shown

### i) Pilot Study Results

347. At least one of the three pilot participants did not read the Premium terms shown on the bottom of the page matching the UPDP; the other two did.
348. When asked about what Premium was, none of the three pilot participants understood it was a subscription. When they reflected on the first task, none could explain Premium.
349. Two of the three participants accidentally enrolled in Premium. Participant 2 (“P2”) chose the Premium shipping option on the SOSP page and the enrollment option on the UPDP page because they did not think they could click on the “No Thanks” link as evidenced by what they said and what they did with their mouse on the screen. P3 talked about not wanting a Premium trial but then accidentally enrolled in Premium in the checkout page via the shipping option during the first task. P3 also did not realize they enrolled in Premium. When asked “did you enroll in Premium,” P3 said “*I did not*”. P1 did not enroll in Premium.
350. At least one participant had problems with the cancellation process. This participant, P3, checked their orders first when trying to cancel Premium. This indicates a misconception about the Premium subscription being confused with an order. This participant also required aid from the research assistant to get through the entire cancellation flow. They also stopped too soon in the cancellation flow thinking that they had completed the process. The other two participants completed the cancellation process with limited technical trouble.

### j) User Study Results

351. Participants who enrolled in Premium
  - (i) **Over one-third of participants (12/30) enrolled in Premium.** Of the 12 participants who enrolled in Premium, nine enrolled on the UPDP page. Three enrolled via the SPC shipping option on the checkout page but none of these three subsequently read or noticed the blue box that appeared when Premium was added to their product checkout flow or linked this box to a Premium subscription. No participants used the SPC blue box on the checkout page to enroll in Premium.
  - (ii) **18/30 participants did not enroll in Premium.** Reasons for not enrolling varied. For instance, P6 said they do not usually take up free trials: “*Why did I say no to it? Um... I guess. That didn't appeal to me, I guess. Um. I don't really see to many things with free trials on there.*” On the other hand, P31 felt that the subscription was not beneficial since they do not eat that much candy and do not mind waiting for deliveries: “*So now I would probably, since I'm not a hardcore candy person and*

*will assume I will not be back within a month to make use of this premium freeness, I would probably say I can wait till Sunday for my candy. And I would click ahead in that mindset.”*

- (iii) **Participants who enrolled at UPDP did not have an option to remove Premium.** None of the participants who enrolled on the UPDP page unenrolled from Premium since the option to remove Premium is not available after the UPDP page. Of the participants who enrolled via the shipping option in the SPC page, none used the delete option to remove the Premium subscription from their cart.
- (iv) **Of the 10/30 participants shown the SOSP page, 4/10 selected the shipping option only available with Premium on the SOSP page.** Two of these participants eventually enrolled in Premium, 1 choosing Premium on the UPDP page (P14) and 1 declined Premium on the UPDP page but enrolled in Premium via the SPC shipping options on the checkout page (P29). Two of the participants declined enrollment at the UPDP page and did not enroll in Premium on the checkout page (P20 and P26).

352. Participants who accidentally enrolled in Premium

- (i) **Two enrollments in Premium were clearly accidental based on what the participants did on the screen and said verbally during the observations.** P4 stated they did not want a Premium subscription and was confused about the shipping options and clicked the option for free shipping with Premium and was enrolled anyway. They then changed the shipping option after enrolling and did not realize they were still enrolled in Premium. P30 did not choose Premium on UPDP and said he did not want it but then he selected the one-day shipping option at checkout which enrolled him and he said that he did not notice that at the time. He also did not know how much Premium would cost him. In both cases, the visual and auditory evidence suggest these enrollments were accidental.

353. Participants who enrolled in Premium and did not understand the terms of a Premium subscription presented in the flows.

- (i) **Most participants did not read the Premium fine print with terms and conditions during the enrollment process when purchasing a product.** This was based on our analysis of what participants said aloud, their actions on the screen, and observations of them as captured by the video and audio transcripts. Participants generally did not notice the Premium fine print terms and conditions or did not to read them during the task. Specifically, 27/30 participants did not read the Premium terms shown on the bottom of the UPDP page when completing their first task of purchasing a product. Only 3/30 read the fine print terms and



conditions of Premium on the bottom of the UPDP page when going through the first task of purchasing a product.

- (ii) **Only two of the 12/30 participants who enrolled in Premium did so being fully informed and intentional about their choice.** This means they knew the cost of Premium, when they would be charged, and didn't have fundamental misconceptions about the nature of Premium, and also indicated verbally that they wanted to enroll in Premium. P8, asked about enrolling in Premium for fun as part of the study: *"So for the purposes of the simulation. Should I select this or do you care?"*. When instructed that they could do what was in line with their preferences, they enrolled saying that since they were not using their own credit card it would be safe to enroll: *"I'm assuming that it is billing this card, which is now empty, is going to have no negative consequences. So I'll just go with that."* This participant was fully aware of the cost of Premium and when and how often they would be charged as coded in our data analysis. The other participant who enrolled in Premium intentionally also fully read the terms of the subscription and felt the trial sounded good so chose to enroll (P12).
- (iii) **10 of the 12/30 participants who enrolled in Premium were not fully informed about the Premium costs, terms, or nature of the Premium subscription.** Note, if participants gave an answer that was within a \$1 of the Premium costs, we considered that correct. For instance, when asked how much Premium cost, P15 said *"What was it, 12 bucks?"* which we considered close enough to be labelled as correct. P17 also correctly recalled the cost and charge timeline of Premium: *"Just, 12.99, I think per month until you cancel. First month is free, first 30 days is free, and there's 12.99 a month"*. 10 of the 12 enrolled participants did not know the costs of Premium. For instance, P22 was asked about the cost of Premium and said *"No, because most websites don't offer a premium. It had one day, two day shipping, you know like that. But it's about the first time I saw Premium"*. The research assistant again asked them how much Premium cost and P22 responded *"No, I say free"*. In another example, P13 decided they wanted the subscription to Premium and got it but they did not know the price of Premium and when asked how much it cost, they said *"Well, free deliveries are free but for Premium was it \$9.95?"*. For instance, P13 decided they wanted Premium and enrolled but they did not recall the price of the subscription accurately: *"Well, free deliveries are free, but for Premium, was it 9.95? (..) Was it? (..) I can't quite remember. I'm sorry, a little older"*. In a similar instance, P14 was genuinely interested in a Premium subscription but was also convinced that no price had been shown to them: *"You didn't have it didn't have a price. There was no price there."* P19 similarly enrolled for fun but could not recall the price: *"I mean, I'll*

*click this just for fun, but it's going to charge me. That's the question.*" P30 did not want to enroll in Premium and selected the one-day free shipping option on the checkout page which he did not notice enrolled him in Premium but also did not recall the cost of Premium. P29 enrolled in Premium since it was not her "*real money*" and she wanted one day shipping and enrolled, then unenrolled and then reenrolled on the checkout page. She could not recall the cost of Premium and said that she "*could save 6.99 or something like that.*"

- (iv) **Four of the 10 participants who were enrolled but uninformed did not understand the general terms and nature of a Premium subscription.** For instance, P7 enrolled in Premium on the UPDP page and did not know the cost of Premium and seem to think that the Premium meant they would get a recurring order of their candy order shipped to them. When the research assistant asked about seeing the terms of Premium, P5, P16, P22 indicated no knowledge of its nature, even though they had enrolled.
- (v) **All 10 participants who were uninformed enrollments mentioned a desire for free fast shipping without necessarily realizing this was tied to Premium.** For instance, P4 did not want to get the Premium subscription and was confused about the shipping option and clicked the free shipping option which enrolled them in Premium. They changed their shipping option after they enrolled but did not realize this option kept them enrolled in Premium. P5 said yes in the UPDP page (see Table for which versions of UPDP each participant saw) for free, fast shipping but did not associate this with Premium. They were asked if they saw options for Candy Premium and said "*No, I don't think I did*" and similarly when asked if they saw how much it costs, they said "*Didn't actually see that.*". In a similar instance, P7 also enrolled in UPDP for free fast shipping but did not know the cost of Premium and seemed to think that Premium meant that they were going to get a recurring candy shipment for the product they were ordering, saying "*I'm thinking about, this free over here. Like, everything. That's what I'm thinking about. (..) I can't wait to get it. That's what I'm thinking about*". P22 also enrolled to get free shipping: "*The delivery free. Everything's free. (4) Free one day delivery with premium. (..) I want that. (..) Yeah.*". Yet they also did not understand the costs: "*No, because most websites don't offer a premium. It have one day, two day shipping, you know, like that. But it's about the first time I saw premium.*" And when asked what it costs for Premium they again said it was free. They further clarified after being told they enrolled in Premium: "*Well, it says it's free. (..) So does that mean that every time you go for a premium, is it going to be free? (..) That's the one thing I would look out for.*" All these examples suggest the visual prominence

of the wording free, fast shipping and Interface Interference do confuse users.

354. Participants who recalled the terms of Premium regardless of whether they enrolled

- (i) **After completing the first task and going through a reflection of their actions, only 9/30 participants correctly recalled all of the information about the cost, frequency of charges, and nature of Premium as a subscription.** This suggests that these terms are not prominent and can easily be missed by consumers.
- (ii) **18/30 participants had difficulty recalling the cost of Premium even after reflecting on the first task flow and seeing the screens for a second time.** For example, P4 took a guess as “*5.99. I think.*”. P28 at first when asked if they remembered seeing the costs of Premium said: “*Premium costs. For the shipping?*”. When the research assistant clarified he was asking about CandyForever Premium and the trial, P28 was still unable to recall the costs: “*Oh, oh I did not. I thought. I didn't because I instantly don't do Premiums like I don't upgrade.*”. Some participants thought there was no price shown such as P14: “*You didn't have it didn't have a price. There was no price there.*”.
- (iii) **1/30 participants had difficulty recalling when they would be charged for Premium even after seeing the enrollment screens a second time.** P25 was only able to respond “*No, I really don't remember...No, I really don't*” when asked about Premium’s terms and when they would be charged. Eight participants were not asked explicitly about when they would be charged and so it is unknown if they knew when charges would be incurred and how frequently. These participants were not asked the question during the session because they did not indicate they knew enough about the Premium subscription to be able to answer the question. Also, given that the think-aloud session questions were semi-structured to adapt to each individual participant’s session, the research assistant had to determine when to ask each question or not to tailor the session appropriately. Three participants had vague answers and so it was not possible to determine if they knew the timeline for monthly charges or not. For 8 participants, we did not explicitly ask about the charge timeline.
- (iv) **9/30 participants had a lack of an understanding of what Premium was more generally.** For example, P15 conflated the benefits of Premium with the premise of CandyForever offering candies from around the world: “*If I were to subscribe from it? Like what? Like what is the only true benefit I would see is probably something that you can get from overseas, something international, you know, because half*

*these things that I got, I'm looking at right now, I can get at a local store.”. Some did not know about what Premium was since it did not grab their attention as summarized by P33: “ I don't know. I didn't really pay attention to it.”*

355. Participants who completed the cancellation flow

- (i) **13/30 participants were able to complete the cancellation process without needing help to find the cancellation option, without checking orders first, and without stopping too soon in the cancellation process.**
- (ii) **The remaining 17/30 participants had trouble completing the cancellation process.** 15/17 participants did eventually complete the cancellation process, many with assistance from the research assistant. For instance, P16 first checked their orders and said on the Orders page: *“Oh so it's a `return to order`: that's what I tap? Yeah... Okay... Canceled orders. What do I do now? I don't know.”* They remained confused about the difference between canceling an order and canceling a Premium subscription: *“I'm lost now. I don't know, it said `cancel the order`. I canceled it and said we aren't finding any cancel order. Why it say that?”*. 2/17 did not successfully complete the cancellation process.
- (iii) **The 2/30 participants who were unable to complete the cancellation process stopped too soon.** Both these participants thought they had completed the process after 1 screen, not knowing they had several more screens to navigate through. P13, who did not check their orders first to find the cancellation option and found the cancellation option without the researcher's aid stopped too soon and said: *“Okay. Continue to cancel. (..) Okay. I think we're successful. What do you think? I think we should be good.”*. The second participant P20 was confusing the Premium subscription with their product order and needed the research assistant's help to find the cancellation option. After they stopped too soon in the cancellation process, after the first cancellation page, they said: *“Okay, so I'm not a premium. I mean I canceled it out. It should be canceled. It say `remind me`. (..) Okay, I'm canceled out”*. Both participants clearly did not understand that the cancellation flow consisted of many more steps.

356. Participants who talked about the cancellation process as being frustrating

- (i) **19/30 participants mentioned that the cancellation screen process was onerous.** In particular, these participants expressed that cancellation had too many steps, or had many options and signposts to try to keep them from cancelling their subscription which was frustrating. Participants also felt that the “remind me later” option would not work for them since they would forget to come back and complete

the process if they used this option. For instance, P8 said of cancellation: *“Man this has more safety guards than launching a nuke. It's pretty... Yeah. Wow”* and later elaborated: *“How many hurdles are you going to put in my way before you allow me to cancel? And you know, there's I think it was three, I want to say. If memory serves. I think it was three. And of course, you know... basic psychology, right? You make the cancellation button. The smallest one, the hardest to find. You know, the one with the sad face by it.”*. Similarly, P10 commented: *“I'm looking for the word cancel. So I found it here. Continue to cancel. You know they ought to make it a little bigger but that's fine. Continue to cancel. And that's what I did. Okay. And then and of course they go ahead with other advertising and things like that, but no, I want to cancel. So I click continue to cancel”*. Finally, P17, talked about the continue to cancel button placement: *“Well, when I got to this page I'm looking at the options remind me later. Continue to cancel keep my benefits. So I saw the three. The middle one is continue to cancel. Which is a little annoying because it's like you're teasing me. You're like continue to cancel. I should be able to just say cancel. Done. You sure? Yes.”*

- (ii) In a particularly articulate quote, P24 said that they expected there to be another screen to confirm in cancellation but elaborated *“But and I feel like all of that makes sense to like, discourage you from canceling it. But because I was planning to cancel, I just hit continue to cancel. And then I was like, oh, there's another screen. So it's like it all. It shows you like the benefits again, basically, or like switching or switching your, your plan, but you're already going to cancel it and you've already like clicked twice to cancel it. So I think this screen is just a bit redundant because you've already like once you click twice to cancel it, you've already made your mind to cancel it.”*
- (iii) In addition to participants mentioning that cancellation was onerous, several participants also took time to process the options on the cancellation pages. P6 spent over a minute on the second cancellation page, silently reading and thinking for most of the time even with prompts from the research assistant as they continued trying to understand the screen. She incorrectly assumed that she was automatically switched to annual payments and then eventually pressed continue to cancel. She said *“Well, they're switching me to annual payments, but I don't want annual payments”*. P9 also stared at the screen until prompted by the research assistant about what they were thinking about and they said: *“I'm thinking about is this actually canceling or what else do I have to do? No. Okay. I just need to keep going.”*



- (i) The enrollment process contains inadequate information about Premium costs and monthly charges. Participants generally did not notice the Premium fine print terms and conditions or did not to read them during the task.
- (ii) Other enrollment misconceptions and issues. Participants were confused the SOSP page's redundancy with the subsequent UPDP pages. For instance, P26 on the SOSP chose shipping on this page exclaiming: *"The shipping... tomorrow! Okay."* After reviewing her order which indicated a shipping time of several days, she again said *"It'll be here tomorrow,"* remembering her selection of one day shipping on the SOSP. She did not realize to keep the shipping speed she would have had to accept the Premium option on the UPDP page or enroll in Premium on the checkout page to keep it that way. Similarly, another participant, P7, was confused with the SOSP where she chose the shipping option and then entered her card information. She then thought the UPDP page was a confirmation page confirming her order was placed and for her to review. She said: *"That'll be it for me, right? (...) And I say for me, okay, I don't want nothing else."* The research assistant prompted her that she would have to continue to finish the purchasing process. She then said *"I did. That's just me reviewing it, right? It's just they asked me, did I want to review it, and I see it. Yeah, because I did. I put this in there. Well, no, that's not how it goes?"*
- (iii) At least one participant was confused in the UPDP page about how to decline to enroll in Premium and advance to the next screen and had to think carefully to understand how to decline because the "No Thanks" link was not a button but a hyperlink. P2 said *"Oh that's weird. Make this bigger or make this more prominent than I have to, like, click this, get one free shipping. So like, oh, my only option"* and when asked to later reflect on their completion of the purchasing task they said: *"That's the only option was to click that there"* referring to the option to enroll in Premium.
- (iv) Other cancellation misconceptions and issues. Some participants were confused about the vagueness of cancellation language around items tied to your subscription may be affected. One wondered aloud if they would not be getting their candy delivery after cancelling. At least two participants felt that having the continue to cancel button in the middle of the other options was confusing and required more effort to find the right button. For instance, P31 said *"Guess in the grand scheme of things, having the continue in the middle felt odd because my assumption would be things would be more skewed to the right. Like, try this, try that. Nope. I'm ready to keep going. So that seemed a little odd that there were sort of like two things on either side, but the continue in the middle, just based on maybe previous experience on other sites."*

P29 similarly said: *“Everything was like right in the middle. So I was I was able to read the options, remind me later because, you know, cancel, keep my benefits and continue to cancel because. Right. I feel like these two were like, trying to stand out for them to try to keep my, to keep the membership, but I continue to cancel.”*

#### k) Notes On Interpreting Study Findings

358. The study findings must be interpreted knowing the context of real-world shopping is always a challenge to replicate exactly. However, even with approximations of a real-world system, some as simple as a mocked-up paper version of a website, most problems with an interface can still be identified as described in Section **Error! Reference source not found.** We do believe that people felt that their real credit cards would be charged (the fine print on the UPDP page equivalent in our study did say that if the default payment did not work, another payment method would be charged if available), whether people chose to enroll in Premium merely because they were in a study situation, and whether or not people believed the deception of them being at risk for recurring bills for CandyForever Premium. Our CandyForever website also did not offer as many products as Amazon or have the same level of detail for customer reviews and some pages were not functional. This may have meant our site was not as fully functional as Amazon but it also means our study had fewer distractions for participants than had they been shopping on Amazon itself, more likely leading to more positive results overall. Similarly, we did not test the Amazon Prime Hard Sell offers which offer no window for cancellation, so the study was set up for the best possible outcome for Amazon. Additionally, our study adheres to all the rigorous principles necessary for an HCI study and the results have produced valuable insights into the issues in the current enrollment and cancellation flows on Amazon.

359. Also, participants in our study may have been more inclined to read information on the screen since we controlled the lab environment so that they were not multi-tasking and performing only the tasks for the study. Studies show when information is presented to users by default (such as giving users multiple opportunities in the study to see the screens with information about Amazon Primes cost, monthly fee, and subscription terms), they tend to pay more attention to it [69,88]. Since we used a think-aloud study [1,2,47], participants in our study were instructed to pay attention to their actions and think aloud about and reflect on each of their actions on the screens. In a real life shopping scenario, users may not be paying as much attention to what information is on each screen since they may be doing multiple tasks at once or focused on their primary task of purchasing an item. In a real-life setting, users would also not be able to go back to



review their actions multiple times as they did in our study.


## IX. Conclusion

360. The user study results confirmed the results of the cognitive walkthrough I conducted of the Prime detours in the checkout process and the cancellation processes. Study participants accidentally enrolled in Prime while navigating the checkout process due to the design issues I had identified in my walkthrough, including, but not limited to, the lack of clarity in the buttons, the forced action of the UPDP. Study participants who knowingly enrolled in Prime did not know the material terms of Prime, including the cost and renewal terms, because they were in the terms and conditions section, in small print. Given the study was conducted in very ideal conditions—participants could take their time going through the flows, they were not engaged in any other tasks while doing the study, and there were no distractions—it is my opinion that the design of the Prime detours in the enrollment flow can confuse consumers and lead them to accidentally enroll in Prime or to enroll in Prime without knowing its material terms. Study participants also did not find the cancellation process easy. Study participants did not finish the cancellation process, and those who did found the process onerous and repetitive, even though they were instructed and incentivized to cancel.

361. In sum, my opinions are:

- (i) The design of how Amazon enrolls consumers in Prime (the Prime detours) during online checkout can confuse consumers to unintentionally enroll in Prime because it violates good design principles;
- (ii) The design of how Amazon enrolls consumers in Prime during online checkout does not convey information on Prime's material terms (cost, end of the free trial period (if applicable), and renewal terms) in a way that consumers are likely to comprehend; and
- (iii) The design of the Iliad and Iliad 2.0 cancellation processes can confuse consumers because they contain too many unnecessary steps and use manipulative designs to prevent consumers from cancelling their Prime subscription.

Dated: February 24, 2025

  
 Marshini Chetty, Ph.D

## REFERENCES

1. Obead Alhadreti and Pam Mayhew. 2016. “Thinking About Thinking Aloud”: An Investigation of Think-Aloud Methods in Usability Testing. In *Proceedings of the 30th International BCS Human Computer Interaction Conference (HCI)*. <https://doi.org/10.14236/ewic/HCI2016.101>
2. Obead Alhadreti and Pam Mayhew. 2018. Rethinking thinking aloud: A comparison of three think-aloud protocols. In *Proceedings of the 2018 CHI conference on human factors in computing systems*, 1–12.
3. Yannis Bakos, Florencia Marotta-Wurgler, and David R. Trossen. 2014. Does Anyone Read the Fine Print? Consumer Attention to Standard-Form Contracts. *The Journal of Legal Studies* 43, 1: 1–35.
4. United States National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. 1978. *The Belmont report: ethical principles and guidelines for the protection of human subjects of research*. Department of Health, Education, and Welfare, National Commission for the for the Protection of Human Subjects of Biomedical and Behavioral Research.
5. Kerstin Bongard-Blanchy, Arianna Rossi, Salvador Rivas, Sophie Doublet, Vincent Koenig, and Gabriele Lenzi. 2021. I am Definitely Manipulated, Even When I am Aware of it. It s Ridiculous! -- Dark Patterns from the End-User Perspective. *Designing Interactive Systems Conference 2021*: 763–776. <https://doi.org/10.1145/3461778.3462086>
6. Christoph Bösch, Benjamin Erb, Frank Kargl, Henning Kopp, and Stefan Pfattheicher. 2016. Tales from the Dark Side: Privacy Dark Strategies and Privacy Dark Patterns. *Proceedings on Privacy Enhancing Technologies* 2016, 4: 237–254. <https://doi.org/10.1515/popets-2016-0038>
7. Harry Brignull. 2012. Dark patterns, 2019. URL: [https://www.darkpatterns.org/\(visited on 02/09/2019\)\(cited on p. 23\)](https://www.darkpatterns.org/(visited on 02/09/2019)(cited on p. 23)).
8. Harry Brignull. 2023. Deceptive patterns: Exposing the tricks tech companies use to control you. <https://www.deceptive.design/book/contents/get-started>.
9. Kelly Caine. 2016. Local Standards for Sample Size at CHI. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16)*, 981–992. <https://doi.org/10.1145/2858036.2858498>
10. Carroll, John. Human Computer Interaction - brief intro. In *The Encyclopedia of Human-Computer Interaction*. Retrieved February 12, 2025 from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/human-computer-interaction-brief-intro>
11. Marshini Chetty, Richard Banks, Richard Harper, Tim Regan, Abigail Sellen, Christos Gkantsidis, Thomas Karagiannis, and Peter Key. 2010. Who’s hogging the bandwidth: the consequences of revealing the invisible in the home. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 659–668.
12. Marshini Chetty, Edwin Blake, and Ewan McPhie. 2006. VoIP deregulation in South Africa: Implications for underserved areas. *Telecommunications Policy* 30, 5: 332–344. <https://doi.org/10.1016/j.telpol.2005.11.007>
13. Marshini Chetty, David Haslem, Andrew Baird, Ugochi Ofoha, Bethany Sumner, and Rebecca Grinter. 2011. Why is my Internet slow? Making network speeds visible. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 1889–1898.
14. Marshini Chetty, Hyojoon Kim, Srikanth Sundaresan, Sam Burnett, Nick Feamster, and W Keith Edwards. 2015. ucap: An internet data management tool for the home. In *Proceedings of the 33rd annual ACM conference on human factors in computing systems*, 3093–3102.
15. Marshini Chetty, Ja-Young Sung, and Rebecca E Grinter. 2007. How smart homes learn: The evolution of the networked home and household. In *International Conference on Ubiquitous Computing*, 127–144.

16. Marshini Chetty, David Tran, and Rebecca E Grinter. 2008. Getting to green: understanding resource consumption in the home. In *Proceedings of the 10th international conference on Ubiquitous computing*, 242–251.
17. Marshini Chetty, William David Tucker, and Edwin H Blake. 2004. Developing locally relevant applications for rural areas: A South African example. In G. Marsden, P. Kotzé, & A. Adesina-Ojo (eds.), *Annual Research Conference of the South African Institute of Computer Scientists and Information Technologists (SAICSIT)*, pp. 234–239, Stellenbosch, South Africa
18. Virginia Clinton. 2019. Reading from paper compared to screens: A systematic review and meta-analysis. *Journal of Research in Reading* 42, 2: 288–325. <https://doi.org/10.1111/1467-9817.12269>
19. Juliet Corbin and Anselm Strauss. 2015. *Basics of qualitative research*. Sage.
20. Nicola Dell, Vidya Vaidyanathan, Indrani Medhi, Edward Cutrell, and William Thies. 2012. “Yours is better!”: participant response bias in HCI. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI ’12)*, 1321–1330. <https://doi.org/10.1145/2207676.2208589>
21. Linda Di Geronimo, Larissa Braz, Enrico Fregnan, Fabio Palomba, and Alberto Bacchelli. 2020. UI Dark Patterns and Where to Find Them: A Study on Mobile Applications and User Perception. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 1–14. <https://doi.org/10.1145/3313831.3376600>
22. Linda Di Geronimo, Larissa Braz, Enrico Fregnan, Fabio Palomba, and Alberto Bacchelli. 2020. UI Dark Patterns and Where to Find Them: A Study on Mobile Applications and User Perception. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI ’20)*, 1–14. <https://doi.org/10.1145/3313831.3376600>
23. Alan Dix and Janet Finlay. 2004. Gregory d. Abowd, and Russell Beale. *Human-Computer Interaction 3ed, Pearson Prentice Hall*.
24. K Anders Ericsson and Herbert A Simon. 1980. Verbal reports as data. *Psychological review* 87, 3: 215.
25. Katy Gero, Alex Calderwood, Charlotte Li, and Lydia Chilton. 2022. A Design Space for Writing Support Tools Using a Cognitive Process Model of Writing. In *Proceedings of the First Workshop on Intelligent and Interactive Writing Assistants (In2Writing 2022)*, 11–24. <https://doi.org/10.18653/v1/2022.in2writing-1.2>
26. Arjan Geven, Reinhard Sefelin, and Manfred Tscheligi. 2006. Depth and breadth away from the desktop: the optimal information hierarchy for mobile use. In *Proceedings of the 8th conference on Human-computer interaction with mobile devices and services*, 157–164.
27. Elizabeth Goodman and Mike Kuniavsky. 2012. *Observing the user experience: A practitioner’s guide to user research*. Elsevier.
28. Paul Graßl, Hanna Schraffenberger, Frederik Zuiderveen Borgesius, and Moniek Buijzen. 2021. Dark and Bright Patterns in Cookie Consent Requests. *Journal of Digital Social Research*. Vol 3, 1: 1-38.
29. Colin M. Gray, Yubo Kou, Bryan Battles, Joseph Hoggatt, and Austin L. Toombs. 2018. The Dark (Patterns) Side of UX Design. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, 1–14. <https://doi.org/10.1145/3173574.3174108>
30. Colin M. Gray, Cristiana Santos, Nataliia Bielova, Michael Toth, and Damian Clifford. 2021. Dark Patterns and the Legal Requirements of Consent Banners: An Interaction Criticism Perspective. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 1–18. <https://doi.org/10.1145/3411764.3445779>
31. Colin M. Gray, Cristiana Teixeira Santos, Nataliia Bielova, and Thomas Mildner. 2024. An Ontology of Dark Patterns Knowledge: Foundations, Definitions, and a Pathway for Shared Knowledge-Building. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI ’24)*, 1–22. <https://doi.org/10.1145/3613904.3642436>
32. Rebecca E Grinter, W Keith Edwards, Marshini Chetty, Erika S Poole, Ja-Young Sung, Jeonghwa Yang, Andy Crabtree, Peter Tolmie, Tom Rodden, Chris Greenhalgh, and others. 2009. The ins and outs of home networking: The case for useful and usable domestic networking. *ACM Transactions*

- on *Computer-Human Interaction (TOCHI)* 16, 2: 1–28.
33. Johanna Gunawan, Amogh Pradeep, David Choffnes, Woodrow Hartzog, and Christo Wilson. 2021. A Comparative Study of Dark Patterns Across Web and Mobile Modalities. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW2: 1–29. <https://doi.org/10.1145/3479521>
  34. Hana Habib, Megan Li, Ellie Young, and Lorrie Cranor. 2022. “Okay, whatever”: An Evaluation of Cookie Consent Interfaces. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems* (CHI ’22), 1–27. <https://doi.org/10.1145/3491102.3501985>
  35. Jinghui Hou, Justin Rashid, and Kwan Min Lee. 2017. Cognitive map or medium materiality? Reading on paper and screen. *Computers in Human Behavior* 67: 84–94. <https://doi.org/10.1016/j.chb.2016.10.014>
  36. Anurata Prabha Hridi, Khawar Latif Khan, Aditya Ravikant Jadhav, Hossein Saedi, Saurabh Nanda, Leanne Serrao, and Benjamin Watson. 2022. Exhibiting Evidence in Remote Courtrooms: Design and Usability Study. In *Companion Publication of the 2022 Conference on Computer Supported Cooperative Work and Social Computing* (CSCW’22 Companion), 102–105. <https://doi.org/10.1145/3500868.3559474>
  37. Ian Ayres and Alan Schwartz,. 2014. “The No-Reading Problem in Consumer Contract Law.” *Stanford Law Review* 66, 3.
  38. Rohit Jaiswal and Harishankar Moosath. 2023. Into the Dark World of User Experience: A Cognitive Walkthrough Study. In *HCI International 2023 Posters*, 609–618. [https://doi.org/10.1007/978-3-031-35989-7\\_77](https://doi.org/10.1007/978-3-031-35989-7_77)
  39. Daniel Kahneman. 2011. *Thinking, fast and slow*. Farrar, Straus and Giroux, New York, NY, US.
  40. Agnieszka Kitkowska. 2023. The Hows and Whys of Dark Patterns: Categorizations and Privacy. In: Gerber, N., Stöver, A., Marky, K. (eds) *Human Factors in Privacy Research*. Springer, Cham. 173–198. [https://doi.org/10.1007/978-3-031-28643-8\\_9](https://doi.org/10.1007/978-3-031-28643-8_9)
  41. Agnieszka Kitkowska, Johan Högborg, and Erik Wästlund. 2022. Online Terms and Conditions: Improving User Engagement, Awareness, and Satisfaction through UI Design. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems* (CHI ’22). <https://doi.org/10.1145/3491102.3517720>
  42. Knemeyer, D. and Svoboda, E. 2015. User Experience - UX. In *The Glossary of Human Computer Interaction*. Interaction Design Foundation - IxDF. Retrieved from <https://www.interaction-design.org/literature/book/the-glossary-of-human-computer-interaction/user-experience-ux>
  43. Matthew B Kugler, Lior Strahilevitz, Marshini Chetty, and Chirag Mahapatra. 2025. Can Consumers Protect Themselves Against Privacy Dark Patterns? *University of Chicago Coase-Sandor Institute for Law & Economics Research Paper*, 25–01.
  44. Priya C. Kumar, Marshini Chetty, Tamara L. Clegg, and Jessica Vitak. 2019. Privacy and Security Considerations For Digital Technology Use in Elementary Schools. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, 1–13. <https://doi.org/10.1145/3290605.3300537>
  45. Priya Kumar, Shalmali Milind Naik, Utkarsha Ramesh Devkar, Marshini Chetty, Tamara L. Clegg, and Jessica Vitak. 2017. “No Telling Passcodes Out Because They’re Private”: Understanding Children’s Mental Models of Privacy and Security Online. *Proceedings of the ACM on Human-Computer Interaction* 1, CSCW: 1–21. <https://doi.org/10.1145/3134699>
  46. Jonathan Lazar, Jinjuan Heidi Feng, and Harry Hochheiser. 2017. *Research methods in human-computer interaction*. Morgan Kaufmann.
  47. Clayton Lewis. 1982. *Using the "thinking-aloud" method in cognitive interface design*. Research Report RC9265 IBM TJ Watson Research Center Yorktown Heights, NY.
  48. Clayton Lewis, Peter G. Polson, Cathleen Wharton, and John Rieman. 1990. Testing a walkthrough methodology for theory-based design of walk-up-and-use interfaces. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI ’90), 235–242. <https://doi.org/10.1145/97243.97279>
  49. Jamie Luguri and Lior Jacob Strahilevitz. 2021. Shining a Light on Dark Patterns | Journal of Legal



- Analysis | Oxford Academic. *Journal of Legal Analysis* 13, 1: 43–109.
50. Jamie Luguri and Lior Jacob Strahilevitz. 2021. Shining a Light on Dark Patterns. *Journal of Legal Analysis* 13, 1: 43–109. <https://doi.org/10.1093/jla/laaa006>
  51. Arunesh Mathur, Gunes Acar, Michael J. Friedman, Elena Lucherini, Jonathan Mayer, Marshini Chetty, and Arvind Narayanan. 2019. Dark Patterns at Scale: Findings from a Crawl of 11K Shopping Websites. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW: 1–32. <https://doi.org/10.1145/3359183>
  52. Arunesh Mathur, Mihir Kshirsagar, and Jonathan Mayer. 2021. What Makes a Dark Pattern... Dark?: Design Attributes, Normative Considerations, and Measurement Methods. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 1–18. <https://doi.org/10.1145/3411764.3445610>
  53. Arunesh Mathur, Arvind Narayanan, and Marshini Chetty. 2018. Endorsements on Social Media: An Empirical Study of Affiliate Marketing Disclosures on YouTube and Pinterest. *Proceedings of the ACM on Human-Computer Interaction* 2, CSCW: 1–26. <https://doi.org/10.1145/3274388>
  54. Nora McDonald, Sarita Schoenebeck, and Andrea Forte. 2019. Reliability and Inter-rater Reliability in Qualitative Research: Norms and Guidelines for CSCW and HCI Practice. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW: 1–23. <https://doi.org/10.1145/3359174>
  55. Thomas Mildner, Merle Freye, Gian-Luca Savino, Philip R. Doyle, Benjamin R. Cowan, and Rainer Malaka. 2023. Defending Against the Dark Arts: Recognising Dark Patterns in Social Media. In *Proceedings of the 2023 ACM Designing Interactive Systems Conference (DIS '23)*, 2362–2374. <https://doi.org/10.1145/3563657.3595964>
  56. Arvind Narayanan, Arunesh Mathur, Marshini Chetty, and Mihir Kshirsagar. 2020. Dark Patterns: Past, Present, and Future. *Queue*. <https://doi.org/10.1145/3400899.3400901>
  57. Jakob Nielsen. 1994. Enhancing the explanatory power of usability heuristics. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '94)*, 152–158. <https://doi.org/10.1145/191666.191729>
  58. Jakob Nielsen. 1994. Usability inspection methods. In *Conference companion on Human factors in computing systems*, 413–414.
  59. Jakob Nielsen and Rolf Molich. 1990. Heuristic evaluation of user interfaces. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '90)*, 249–256. <https://doi.org/10.1145/97243.97281>
  60. Don Norman. 2013. *The design of everyday things: Revised and expanded edition*. Basic books.
  61. Don Norman, Jim Miller, and Austin Henderson. 1995. What you see, some of what's in the future, and how we go about doing it: HI at Apple Computer. In *Conference companion on Human factors in computing systems*, 155.
  62. Midas Nouwens, Ilaria Liccardi, Michael Veale, David Karger, and Lalana Kagal. 2020. Dark Patterns after the GDPR: Scraping Consent Pop-ups and Demonstrating their Influence. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 1–13. <https://doi.org/10.1145/3313831.3376321>
  63. Jonathan A. Obar and Anne Oeldorf-Hirsch. 2020. The biggest lie on the Internet: ignoring the privacy policies and terms of service policies of social networking services. *Information, Communication & Society* 23, 1: 128–147. <https://doi.org/10.1080/1369118X.2018.1486870>
  64. Gustav Öquist and Kristin Lundin. 2007. Eye movement study of reading text on a mobile phone using paging, scrolling, leading, and RSVP. In *Proceedings of the 6th International Conference on Mobile and Ubiquitous Multimedia (MUM '07)*, 176–183. <https://doi.org/10.1145/1329469.1329493>
  65. Peter G Polson, Clayton Lewis, John Rieman, and Cathleen Wharton. 1992. Cognitive walkthroughs: a method for theory-based evaluation of user interfaces. *International Journal of man-machine studies* 36, 5: 741–773.
  66. Erika Shehan Poole, Marshini Chetty, Rebecca E Grinter, and W Keith Edwards. 2008. More than meets the eye: transforming the user experience of home network management. In *Proceedings of*

- the 7th ACM conference on Designing interactive systems*, 455–464.
67. Erika Shehan Poole, Marshini Chetty, Tom Morgan, Rebecca E Grinter, and W Keith Edwards. 2009. Computer help at home: methods and motivations for informal technical support. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 739–748.
  68. Jake Reichel, Fleming Peck, Mikako Inaba, Bisrat Moges, Brahmnoor Singh Chawla, and Marshini Chetty. 2020. “I have too much respect for my elders”: Understanding South African Mobile Users’ Perceptions of Privacy and Current Behaviors on Facebook and WhatsApp. In *29th USENIX Security Symposium (USENIX Security 20)*.
  69. Eric P. Robinson and Yicheng Zhu. 2020. Beyond “I Agree”: Users’ Understanding of Web Site Terms of Service. *Social Media + Society* 6, 1: 2056305119897321. <https://doi.org/10.1177/2056305119897321>
  70. Julianne Romanosky and Marshini Chetty. 2018. Understanding the use and impact of the zero-rated free basics platform in south africa. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, 1–13.
  71. Andrew Ross, Nina Chen, Elisa Zhao Hang, Elena L. Glassman, and Finale Doshi-Velez. 2021. Evaluating the Interpretability of Generative Models by Interactive Reconstruction. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI ’21)*. <https://doi.org/10.1145/3411764.3445296>
  72. Saldana, Johnny. *The Coding Manual for Qualitative Researchers* | SAGE Publications Ltd. Retrieved August 27, 2024 from <https://uk.sagepub.com/en-gb/eur/the-coding-manual-for-qualitative-researchers/book273583>
  73. Brennan Schaffner, Arjun Nitin Bhagoji, Siyuan Cheng, Jacqueline Mei, Jay L Shen, Grace Wang, Marshini Chetty, Nick Feamster, Genevieve Lakier, and Chenhao Tan. 2024. “Community Guidelines Make this the Best Party on the Internet”: An In-Depth Study of Online Platforms’ Content Moderation Policies. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI ’24)*. <https://doi.org/10.1145/3613904.3642333>
  74. Brennan Schaffner, Neha A. Lingareddy, and Marshini Chetty. 2022. Understanding Account Deletion and Relevant Dark Patterns on Social Media. *Proc. ACM Hum.-Comput. Interact.* 6, CSCW2. <https://doi.org/10.1145/3555142>
  75. Brennan Schaffner, Neha Lingareddy, and Marshini Chetty. 2022. Understanding Account Deletion and Relevant Dark Patterns On Social Media. *Proc. ACM Hum.-Comput. Interact.* 6, CSCW2, Article 417 (November 2022), 43 pages.1, 1: 29.
  76. Brennan Schaffner, Antonia Stefanescu, Olivia Campili, and Marshini Chetty. 2023. Don’t Let Netflix Drive the Bus: User’s Sense of Agency Over Time and Content Choice on Netflix. *Proceedings of the ACM on human-computer interaction* 7, CSCW1: 1–32.
  77. Stuart E. Schechter, Rachna Dhamija, Andy Ozment, and Ian Fischer. 2007. The Emperor’s New Security Indicators. In *2007 IEEE Symposium on Security and Privacy (SP ’07)*, 51–65. <https://doi.org/10.1109/SP.2007.35>
  78. Helen Sharp, Jennifer Preece, and Yvonne Rogers. 2023. *Interaction Design: Beyond Human-Computer Interaction*. Wiley, Indianapolis, IN.
  79. Ashley Sheil, Gunes Acar, Hanna Schraffenberger, Raphaël Gellert, and David Malone. 2024. Staying at the Roach Motel: Cross-Country Analysis of Manipulative Subscription and Cancellation Flows. In *Proceedings of the CHI Conference on Human Factors in Computing Systems*, 1–24.
  80. Ben Shneiderman. 2004. Designing for fun: how can we design user interfaces to be more fun? *interactions* 11, 5: 48–50.
  81. Ben Shneiderman, Catherine Plaisant, Maxine Cohen, Steven Jacobs, Niklas Elmqvist, and Nicholas Diakopoulos. 2016. *Designing the User Interface: Strategies for Effective Human-Computer Interaction*. Pearson.
  82. Sujana Shrestha. 2007. Mobile web browsing: usability study. In *Proceedings of the 4th international conference on mobile technology, applications, and systems and the 1st international symposium on Computer human interaction in mobile technology*, 187–194.

83. Ray Sin, Ted Harris, Simon Nilsson, and Talia Beck. 2022. Dark patterns in online shopping: do they work and can nudges help mitigate impulse buying? *Behavioural Public Policy*: 1–27. <https://doi.org/10.1017/bpp.2022.11>
84. Than Htut Soe, Oda Elise Nordberg, Frode Guribye, and Marija Slavkovik. 2020. Circumvention by design - dark patterns in cookie consent for online news outlets. In *Proceedings of the 11th Nordic Conference on Human-Computer Interaction: Shaping Experiences, Shaping Society*, 1–12. <https://doi.org/10.1145/3419249.3420132>
85. Rick Spencer. 2000. The streamlined cognitive walkthrough method, working around social constraints encountered in a software development company. In *Proceedings of the SIGCHI conference on Human Factors in Computing Systems*, 353–359.
86. Sruti Srinivasa Ragavan, Advait Sarkar, and Andrew D Gordon. 2021. Spreadsheet Comprehension: Guesswork, Giving Up and Going Back to the Author. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (CHI '21). <https://doi.org/10.1145/3411764.3445634>
87. Statista. Frequency of online purchase in the United States as of January 2021. *Statista*. Retrieved from <https://www.statista.com/statistics/448659/online-shopping-frequency-usa/>
88. Nili Steinfeld. 2016. “I agree to the terms and conditions”: (How) do users read privacy policies online? An eye-tracking experiment. *Computers in Human Behavior* 55: 992–1000. <https://doi.org/10.1016/j.chb.2015.09.038>
89. Michael Swart, Ylana Lopez, Arunesh Mathur, and Marshini Chetty. 2020. Is This An Ad?: Automatically Disclosing Online Endorsements On YouTube With AdIntuition. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 1–12. <https://doi.org/10.1145/3313831.3376178>
90. Richard H. Thaler and Cass R. Sunstein. 2009. *Nudge: Improving Decisions About Health, Wealth, and Happiness*. Penguin Books, New York.
91. Van Hong Tran, Aarushi Mehrotra, Marshini Chetty, Nick Feamster, Jens Frankenreiter, and Lior Strahilevitz. 2024. Measuring Compliance with the California Consumer Privacy Act Over Space and Time. In *Proceedings of the CHI Conference on Human Factors in Computing Systems*, 1–19.
92. Amos Tversky and Daniel Kahneman. 1974. Judgment under Uncertainty: Heuristics and Biases. *Science*, 185: 10: 1124–1131.
93. Christine Utz, Martin Degeling, Sascha Fahl, Florian Schaub, and Thorsten Holz. 2019. (Un)informed Consent: Studying GDPR Consent Notices in the Field. In *Proceedings of the 2019 ACM SIGSAC Conference on Computer and Communications Security* (CCS '19), 973–990. <https://doi.org/10.1145/3319535.3354212>
94. Kelly B Wagman, Elana B Blinder, Kevin Song, Antoine Vignon, Solomon Dworkin, Tamara Clegg, Jessica Vitak, and Marshini Chetty. 2023. “ We picked community over privacy”: Privacy and Security Concerns Emerging from Remote Learning Sociotechnical Infrastructure During COVID-19. *Proceedings of the ACM on Human-Computer Interaction* 7, CSCW2: 1–29.
95. Ari Ezra Waldman. 2020. Cognitive biases, dark patterns, and the ‘privacy paradox.’ *Current Opinion in Psychology* 31: 105–109. <https://doi.org/10.1016/j.copsyc.2019.08.025>
96. Cathleen Wharton, John Rieman, Clayton Lewis, and Peter Polson. 1994. The cognitive walkthrough method: a practitioner’s guide. In *Usability Inspection Methods*. John Wiley & Sons, Inc., USA, 105–140.
97. Lauren E. Willis. 2020. Deception by Design. *Harv. JL & Tech.* 34, 115.
98. Philipp Winter, Anne Edmundson, Laura M Roberts, Agnieszka Dutkowska-Żuk, Marshini Chetty, and Nick Feamster. 2018. How do tor users interact with onion services? In *27th USENIX Security Symposium (USENIX Security 18)*, 411–428.
99. Qian Yang, Aaron Steinfeld, and John Zimmerman. 2019. Unremarkable AI: Fitting Intelligent Decision Support into Critical, Clinical Decision-Making Processes. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (CHI '19), 1–11. <https://doi.org/10.1145/3290605.3300468>
100. Amit Zac, Yun-Chun Huang, Amédée von Moltke, Christopher Decker, and Ariel Ezrachi. 2023.



- Dark patterns and online consumer vulnerability. *Behavioural Public Policy*, 1-50..
101. 10 Usability Heuristics for User Interface Design. *Nielsen Norman Group*. Retrieved November 18, 2024 from <https://www.nngroup.com/articles/ten-usability-heuristics/>
  102. Daniel Kahneman. 2011. *Thinking, fast and slow*. Farrar, Straus and Giroux, New York, NY, US.
  103. Heuristic Evaluations: How to Conduct. *Nielsen Norman Group*. Retrieved December 10, 2024 from <https://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation/>
  104. How to Conduct a Cognitive Walkthrough Workshop. *Nielsen Norman Group*. Retrieved December 10, 2024 from <https://www.nngroup.com/articles/cognitive-walkthrough-workshop/>
  105. How Many Test Users in a Usability Study? *Nielsen Norman Group*. Retrieved December 10, 2024 from <https://www.nngroup.com/articles/how-many-test-users/>
  106. Scrolling and Attention (Jakob Nielsen's Original Research Study). *Nielsen Norman Group*. Retrieved November 18, 2024 from <https://www.nngroup.com/articles/scrolling-and-attention-original-research/>
  107. The Illusion of Completeness: What It Is and How to Avoid It. *Nielsen Norman Group*. Retrieved November 18, 2024 from <https://www.nngroup.com/articles/illusion-of-completeness/>
  108. Online shops: Amazon shoppers in the United States. *Statista*. Retrieved August 27, 2024 from <https://www-statista-com.proxy.uchicago.edu/study/68415/online-shops-amazon-shoppers-in-the-united-states/>
  109. Share of Amazon shoppers in the United States as of May 2023, by generation. *Statista*. Retrieved from <https://www-statista-com.proxy.uchicago.edu/statistics/1278936/amazon-shoppers-by-generation-united-states/>